M4A78 PRO

Motherboard

E4341

First Edition V1
December 2008

Copyright © 2008 ASUSTeK Computer Inc. All Rights Reserved.

No part of this manual, including the products and software described in it, may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form or by any means, except documentation kept by the purchaser for backup purposes, without the express written permission of ASUSTeK Computer Inc. (“ASUS”).

Product warranty or service will not be extended if: (1) the product is repaired, modified or altered, unless such repair, modification of alteration is authorized in writing by ASUS; or (2) the serial number of the product is defaced or missing.

ASUS PROVIDES THIS MANUAL “AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL ASUS, ITS DIRECTORS, OFFICERS, EMPLOYEES OR AGENTS BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES (INCLUDING DAMAGES FOR LOSS OF PROFITS, LOSS OF BUSINESS, LOSS OF USE OR DATA, INTERRUPTION OF BUSINESS AND THE LIKE), EVEN IF ASUS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES ARISING FROM ANY DEFECT OR ERROR IN THIS MANUAL OR PRODUCT.

SPECIFICATIONS AND INFORMATION CONTAINED IN THIS MANUAL ARE FURNISHED FOR INFORMATIONAL USE ONLY, AND ARE SUBJECT TO CHANGE AT ANY TIME WITHOUT NOTICE, AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY ASUS. ASUS ASSUMES NO RESPONSIBILITY OR LIABILITY FOR ANY ERRORS OR INACCURACIES THAT MAY APPEAR IN THIS MANUAL, INCLUDING THE PRODUCTS AND SOFTWARE DESCRIBED IN IT.

Products and corporate names appearing in this manual may or may not be registered trademarks or copyrights of their respective companies, and are used only for identification or explanation and to the owners’ benefit, without intent to infringe.

Contents

Contents iii
Notices vi
Safety information vii
About this guide vii
M4A78 PRO specifications summary ix

Chapter 1 Product introduction

1.1 Welcome! 1-1
1.2 Package contents 1-1
1.3 Special features 1-1
1.3.1 Product highlights 1-1
1.3.2 Innovative ASUS features 1-2
1.4 Before you proceed 1-4
1.5 Motherboard overview 1-5
1.5.1 Placement direction 1-5
1.5.2 Screw holes 1-5
1.5.3 Motherboard layout 1-6
1.5.4 Layout contents 1-6
1.6 Central Processing Unit (CPU) 1-7
1.6.1 Installing the CPU 1-7
1.6.2 Installing the heatsink and fan 1-8
1.7 System memory 1-10
1.7.1 Overview 1-10
1.7.2 Memory configurations 1-10
1.7.3 Installing a DIMM 1-15
1.7.4 Removing a DIMM 1-15
1.8 Expansion slots 1-16
1.8.1 Installing an expansion card 1-16
1.8.2 Configuring an expansion card 1-16
1.8.3 PCI slots 1-16
1.8.4 PCI Express x1 slots 1-16
1.8.5 PCI Express x16 slot 1-16
1.9 Jumpers 1-17
1.10 Connectors 1-19
1.10.1 Rear panel connectors 1-19
1.10.2 Internal connectors 1-22

Contents

1.11 Software support 1-31

1.11.1 Installing an operating system 1-31

1.11.2 Support DVD information 1-31

Chapter 2 BIOS information

2.1 Managing and updating your BIOS 2-1

2.1.1 Creating a bootable floppy disk 2-1

2.1.2 ASUS Update utility 2-2

2.1.3 ASUS EZ Flash 2 utility 2-3

2.1.4 AFUDOS utility 2-4

2.1.5 ASUS CrashFree BIOS 3 utility 2-5

2.2 BIOS setup program 2-6

2.2.1 BIOS menu screen 2-7

2.2.2 Menu bar 2-7

2.2.3 Navigation keys 2-8

2.2.4 Menu items 2-8

2.2.5 Submenu items 2-8

2.2.6 Configuration fields 2-8

2.2.7 General help 2-8

2.2.8 Pop-up window 2-8

2.2.9 Scroll bar 2-8

2.3 Main menu 2-9

2.3.1 System Time 2-9

2.3.2 System Date 2-9

2.3.3 Legacy Diskette A 2-9

2.3.4 Primary IDE Master/Slave 2-9

2.3.5 SATA 1–6 2-10

2.3.6 Storage Configuration 2-11

2.3.7 System Information 2-11

2.4 Ai Tweaker menu 2-12

2.4.1 AI Overclocking 2-12

2.4.2 DRAM Frequency Control 2-12

2.4.3 HT Link Speed 2-13

2.4.4 Processor Voltage 2-15

2.4.5 CPU/NB Voltage 2-15

2.4.6 CPU VDDA Voltage 2-16

Contents

2.4.7 DRAM Voltage 2-16
2.4.8 HT Voltage 2-16
2.4.9 NB Voltage 2-16
2.4.10 NB 1.8V Voltage 2-16
2.4.11 SB Voltage 2-16
2.4.12 CPU Spread Spectrum 2-16
2.4.13 PCIE Spread Spectrum 2-16
2.4.14 SB Clock Spread Spectrum 2-16

2.5 Advanced menu 2-17
2.5.1 CPU Configuration 2-17
2.5.2 Chipset 2-18
2.5.3 Onboard Devices Configuration 2-20
2.5.4 USB Configuration 2-21

2.6 Power menu 2-21
2.6.1 Suspend Mode 2-22
2.6.2 Repost Video on S3 Resume 2-22
2.6.3 ACPI 2.0 Support 2-22
2.6.4 ACPI APIC Support 2-22
2.6.5 APM Configuration 2-22
2.6.6 Hardware Monitor 2-23

2.7 Boot menu 2-24
2.7.1 Boot Device Priority 2-24
2.7.2 Boot Settings Configuration 2-24
2.7.3 Security 2-25

2.8 Tools menu 2-26
2.8.1 ASUS EZ Flash 2 2-26
2.8.2 Express Gate 2-26
2.8.3 ASUS O.C. Profile 2-27
2.8.4 AI NET 2 2-27

2.9 Exit menu 2-28

Notices

Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This class B digital apparatus complies with Canadian ICES-003.

DO NOT throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

DO NOT throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

Safety information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Ensure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, ensure that all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

About this guide

This user guide contains the information you need when installing and configuring the motherboard.

How this guide is organized

This guide contains the following parts:

- **Chapter 1: Product introduction**

  This chapter describes the features of the motherboard and the new technology it supports.

- **Chapter 2: BIOS setup**

  This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

Conventions used in this guide

To ensure that you perform certain tasks properly, take note of the following symbols used throughout this manual.

DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task.

CAUTION: Information to prevent damage to the components when trying to complete a task.

IMPORTANT: Instructions that you MUST follow to complete a task.

NOTE: Tips and additional information to help you complete a task.

Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. **ASUS websites**

   The ASUS website provides updated information on ASUS hardware and software products. Refer to the ASUS contact information.

2. **Optional documentation**

   Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

Typography

Bold text	Indicates a menu or an item to select.
Italics	Used to emphasize a word or a phrase.
<Key>	Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key. Example: <Enter> means that you must press the Enter or Return key.
<Key1>+<Key2>+<Key3>	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: <Ctrl>+<Alt>+<D>
`Command`	Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets. Example: At the DOS prompt, type the command line: **`afudos /iM4A78PRO.ROM`**

M4A78 PRO specifications summary

CPU	AMD® Phenom™ X4 / Phenom™ X3 / Athlon™ X2 / Athlon™ / Sempron™ processors (socket AM2+/AM2) Compatible with AMD® Phenom™ II / Athlon™ X4/ Athlon™ X3 / Athlon™ X2 (AM3 CPU) AMD® 45nm CPU support AMD Cool'n'Quiet™ Technology
Chipset	AMD 780G / SB700
System bus	Up to 5200 MT/s; HyperTransport™ 3.0 interface for AM3 / AM2+ CPU 2000 / 1600 MT/s for AM2 CPU
Memory	Dual-channel memory architecture - 4 x 240-pin DIMM sockets support unbufferred ECC / non-ECC DDR2 1066* / 800 / 667 MHz memory modules - Supports up to 16 GB system memory *Due to AMD CPU limitation, DDR2 1066 is supported by AM2+ / AM3 CPUs for one DIMM per channel only. Refer to www.asus.com or this user manual for the Memory QVL (Qualified Vendors Lists). ** Due to OS limitation, when installing total memory of 4GB capacity or more, Windows 32-bit operation system may only recognize less than 3GB. Hence, a total installed memory of less than 3GB is recommended.
VGA	Integrated ATI Radeon™ HD 3200 GPU - Supports HDMI™ Technology with max. resolution up to 1920 x 1080 (1080P) - Supports Dual-link DVI with max. resolution up to 2560 x 1600 @ 60Hz - Supports D-Sub with max. resolution up to 2560 x 1440 @ 75 Hz - Hybrid CrossFireX™ support HDMI / DVI / D-Sub support (Dual independent displays support with HDMI / DVI and D-Sub) - Supports Microsoft® DirectX 10, OpenGL 2.0, Pixel Shader 4.0 - Hardware Decode Acceleration for H.264, VC-1, and MPEG-2 - Maximum shared memory of 512MB
Expansion Slots	1 x PCIe 2.0 x16 slot 2 x PCIe x1 slots 3 x PCI 2.2 slots

(continued on the next page)

M4A78 PRO specifications summary

Storage	1 x Ultra DMA 133/100/66 for up to 2 PATA devices 6 x SATA 3.0 Gb/s connectors supporting RAID 0, 1, 10 and JBOD configuration
LAN	Atheros® L1E Gigabit LAN controller featuring AI NET 2
High Definition Audio	VIA1708S 8-channel High Definition Audio CODEC - Supports Jack-Detection and Multi-Streaming - Optical S/PDIF Out port at back I/O - ASUS Noise Filter
USB	12 x USB 2.0 /1.1 ports (8 at mid-board; 4 on the rear panel)
ASUS Unique Features	**ASUS Power Solution:** - ASUS 4+1 Phase Power Design - ASUS Anti-Surge Protection **ASUS Green Design:** - ASUS EPU - ASUS AI Nap **ASUS Quiet Thermal Solution:** - ASUS Fanless Design: Feather heatsink solution - ASUS Q-Fan 2 **ASUS EZ DIY** - ASUS Express Gate - ASUS Q-Connector - ASUS CrashFree BIOS 3 - ASUS O.C. Profile - ASUS EZ Flash 2
Special Features	Uses 100% All High-quality Conductive Polymer Capacitors! ASUS MyLogo 2™ AMD OverDrive Support* * Advanced cooling system is required when advanced overclock functions of AMD OverDrive are enabled.

(continued on the next page)

M4A78 PRO specifications summary

ASUS Exclusive Overclocking Features	**Intelligent overclocking tools:** - AI Overclocking (Intelligent CPU Frequency Tuner) - ASUS TurboV - ASUS Turbo Key **Precision Tweaker:** - vCore: Adjustable CPU voltage at 50mv increment - vDIMM: 8-step DRAM voltage control - vChipset: 4-step Chipset voltage control **SFS (Stepless Frequency Selection):** - FSB tuning from 200MHz up to 600MHz at 1MHz increment - PCIe frequency tuning from 100MHz to 150MHz at 1MHz increment **Overclocking protection:** - ASUS C.P.R. (CPU Parameter Recall)
Rear panel I/O ports	1 x PS/2 keyboard port (purple) 1 x PS/2 mouse port (green) 1 x S/PDIF Out (Optical) 1 x HDMI Out 1 x D-Sub 1 x DVI 1 x LAN (RJ-45) 4 x USB 2.0/1.1 8-channel audio I/O
Internal I/O connectors	4 x USB connectors support additional 8 USB ports 1 x Floppy disk drive connector 1 x COM connector 1 x IDE connector 6 x SATA connectors 1 x CPU Fan connector 1 x Chassis Fan connector 1 x Power Fan connector 1 x Front panel audio connector 1 x S/PDIF Out Header 1 x Chassis Intrusion connector 1 x CD audio in 1 x 24-pin ATX Power connector 1 x 4-pin ATX 12V Power connector 1 x System Panel (Q-Connector)

(continued on the next page)

M4A78 PRO specifications summary

BIOS features	8 Mb Flash ROM, AMI BIOS, PnP, DMI 2.0, WfM2.0, SM BIOS 2.5, ACPI 2.0a, ASUS EZ Flash 2
Support DVD contents	Drivers Express Gate ASUS PC Probe II ASUS Update AMD OverDrive Utility (AOD) Anti-Virus Utility (OEM version)
Form factor	ATX form factor: 12 in x 9.6 in (30.5 cm x 24.4 cm)

***Specifications are subject to change without notice.**

Chapter 1
Product introduction

1.1 Welcome!

Thank you for buying an ASUS® M4A78 PRO motherboard!

The motherboard delivers a host of new features and latest technologies, making it another standout in the long line of ASUS quality motherboards!

Before you start installing the motherboard, and hardware devices on it, check the items in your package with the list below.

1.2 Package contents

Check your motherboard package for the following items.

Motherboard	ASUS M4A78 PRO motherboard
Cables	1 x Serial ATA cable 2 x SATA cables
Accessories	1 x I/O shield
Application DVD	ASUS motherboard support DVD
Documentations	User manual

If any of the above items is damaged or missing, contact your retailer.

1.3 Special features

1.3.1 Product highlights

AMD® Phenom™ II / Athlon™ X4 / Athlon™ X3 / Athlon™ X2 processors (socket AM3)

This motherboard supports AMD® AM3 multi-core processors with unique L3 cache and delivers better overclocking capabilities with less power consumption. It features dual-channel DDR2 1066 memory support and accelerates data transfer rate up to 5200MT/s via HyperTransort™ 3.0 based system bus. This motherboard also supports AMD® CPUs in the new 45nm manufacturing process.

AMD® Phenom™ X4 / Phenom™ X3 / Athlon™ X2 / Athlon™ / Sempron™ processors (socket AM2+ / AM2)

The motherboard supports AMD® Socket AM2+ multi-core processors. It features dual-channel DDR2 1066 memory support, data transfer rate up to 5200MT/s via HyperTransport™ 3.0 based system bus and AMD® Cool 'n' Quiet!™ Technology.

AMD® 780G chipset

The AMD 780G Northbridge is the latest AMD chipset designed for both HT1.0 and 5200MT/s HyperTransport™ 3.0 (HT 3.0) interface speed and external graphics in PCI Express 2.0 standard. It features the integrated ATI RV610-based graphics and fully Directx 10.0 compliant.

Dual channel DDR2 1066 support

This motherboard supports DDR2 1066, which provides faster data transfer rate and more bandwidth to increase memory data transfer rate and computing efficiency. This enhances system performance in 3D graphics and other memory demanding applications.

Due to AM2+ CPU limitation, only one DDR2 1066 is supported per channel. When four DDR2 1066 DIMMs are installed, all DIMMs run at 800MHz frequency by default for system stability.

AMD® Hybrid CrossFireX Technology

Hybrid CrossFireX Technology is a unique multi-GPU technology combining the onboard GPU and the discrete graphics card together to enhance 3D graphics performance.

Visit www.amd.com for the Hybrid CrossfireX selected GPUs.

1.3.2 Innovative ASUS features

ASUS Power Solution

ASUS 4+1 Phase Power Design

To fully unleash the next-generation AM3 CPU's potential, ASUS M4A78 PRO motherboard has adopted a brand-new 4-phase VRM power design. It delivers high power efficiency and supreme overclocking ability. Furthermore, high quality power components can effective lower system temperature to ensure longer component lifespan. ASUS M4A78 PRO also features an extra 1-phase power for integrated memory/HT controller to provide independent power to vital components.

ASUS EPU

The ASUS EPU (Energy Processing Unit) provides total system energy efficiency by detecting current PC loadings and intelligently moderating power in real-time. It automatically provides the most appropriate power usage for the CPU, VGA card, memory, chipset, hard drives, and system fans—helping save power and money!

ASUS Anti-Surge

This special design prevents expensive devices and the motherboard from damage caused by lighting strikes or power surges.

AI Nap

With AI Nap, the system can continue running at minimum power and noise when you are temporarily away. To wake the system and return to the OS environment, simply click the mouse or press a key.

ASUS EZ O.C.

ASUS TurboV

Feel the adrenaline rush of real-time O.C.—now a reality with the ASUS TurboV. This easy O.C. tool allows you to overclock without exiting or rebooting the OS: and its user-friendly interface makes overclock with ust a few clicks away. More, the ASUS OC Profiles in TurboV provides the best O.C. settings in different scenarios.

ASUS Turbo Key

ASUS Turbo Key allows the user to turn the PC power button into a physical overclocking button. After the easy setup, Turbo Key can boost performances without interrupting ongoing work or games—with just one touch!

Other ASUS Features

ASUS Express Gate

Taking only 5 seconds to bootup, Express Gate is the one-stop gateway to instant fun! It's a unique motherboard built-in OS. You can utilize the most popular Instant Messengers (IM) like MSN, Skype, Google talk, QQ, and Yahoo! Messenger to keep in touch with friends, or quickly check on the weather and e-mails just before leaving your house. What's more, the user-friendly picture manager lets you view your pictures without entering Windows at anytime!

The actual boot time depends on the system configuration.

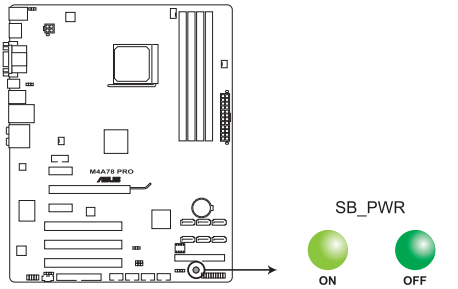
1.4 Before you proceed

Take note of the following precautions before you install motherboard components or change any motherboard settings.

- Unplug the power cord from the wall socket before touching any component.
- Before handling components, use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, to avoid damaging them due to static electricity.
- Hold components by the edges to avoid touching the ICs on them.
- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
- Before you install or remove any component, switch off the ATX power supply and detach its power cord. Failure to do so may cause severe damage to the motherboard, peripherals, or components.

Onboard LED

The motherboard comes with a standby power LED that lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows the location of the onboard LED.



M4A78 PRO Onboard LED

1.5 Motherboard overview

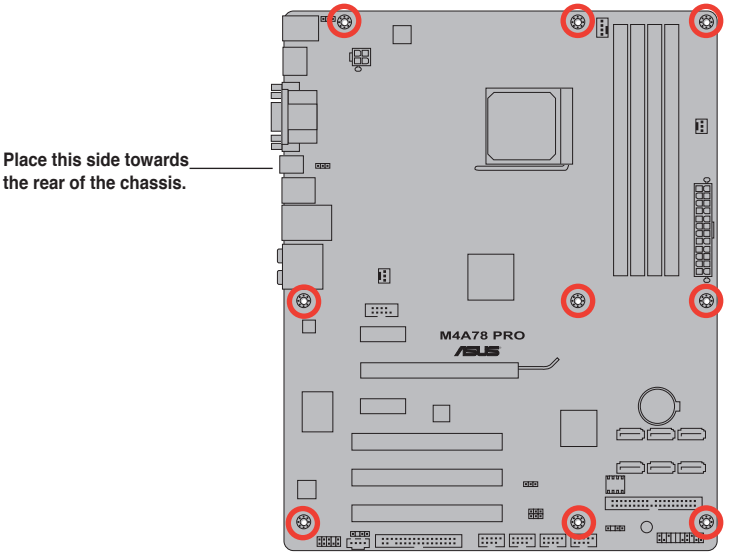
1.5.1 Placement direction

When installing the motherboard, ensure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

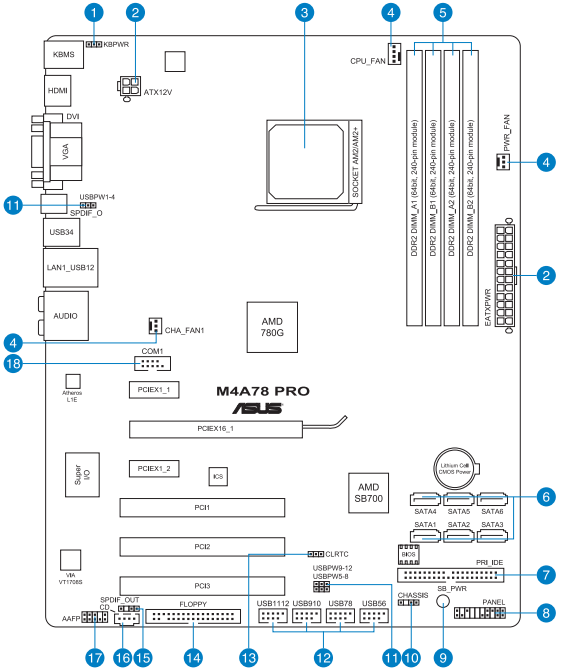
1.5.2 Screw holes

Place nine (9) screws into the holes indicated by circles to secure the motherboard to the chassis.

Do not overtighten the screws! Doing so can damage the motherboard.



1.5.3 Motherboard layout



1.5.4 Layout contents

Connectors/Jumpers/Slots		Page
1.	Keyboard power (3-pin KBPWR)	1-18
2.	ATX power connectors (24-pin EATXPWR, 4-pin ATX12V)	1-23
3.	CPU socket AM2+/AM2	1-7
4.	CPU, Chassis and Power Fan connectors (4-pin CPU_FAN, 3-pin CHA_FAN1, 3-pin PWR_FAN)	1-22
5.	DDR2 DIMM slots	1-10
6.	Serial ATA connectors (7-pin SATA1-6)	1-25
7.	IDE connector (40-1 pin PRI_IDE)	1-24
8.	System panel connector (10-1 pin PANEL)	1-26
9.	Onboard LED (SB_PWR)	1-4
10.	Chassis intrusion connector (4-1 pin CHASSIS)	1-22
11.	USB device wake-up (3-pin USBPW1-4, USBPW5-8, USBPW9-12)	1-18
12.	USB connectors (10-1 pin USB56, USB78, USB910, USB1112)	1-27
13.	Clear RTC RAM (CLRTC)	1-17
14.	Floppy disk drive connector (34-1 pin FLOPPY)	1-27
15.	Digital audio connector (4-1 pin SPDIF_OUT)	1-28
16.	Optical drive audio in connector (4-pin CD)	1-28
17.	Front panel audio connector (10-1 pin AAFP)	1-29
18.	Serial port connector (10-1 pin COM1)	1-29

1.6 Central Processing Unit (CPU)

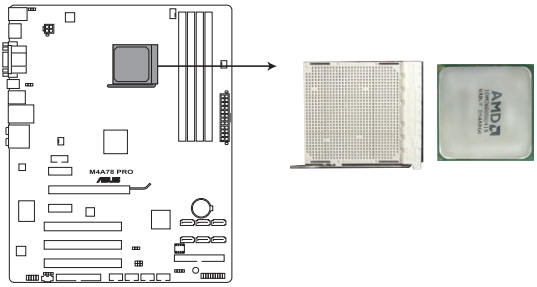
The motherboard comes with a CPU socket designed for AMD® AM3 Phenom™ II / Athlon™ X4 / Athlon™ X3 / Athlon™ X2 processors and AM2+ / AM2 Phenom™ X4 / Phenom™ X3 / Athlon™ X2 / Athlon™ / Sempron™ processors.

The CPU socket is not compatible with AMD® Opteron™ processors. Do not install an Opteron™ processor on this motherboard.

1.6.1 Installing the CPU

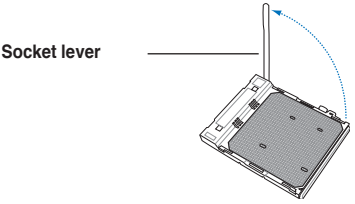
To install a CPU:

1. Locate the CPU socket on the motherboard.



M4A78 PRO CPU socket AM2+/AM2

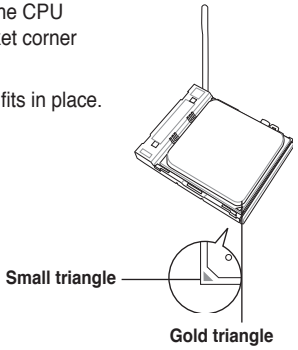
2. Press the lever sideways to unlock the socket, then lift it up to a 90°-100° angle.



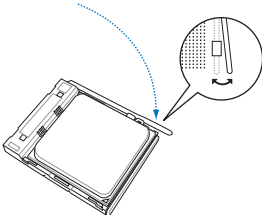
Ensure that the socket lever is lifted up to 90°-100° angle, otherwise the CPU will not fit in completely.

3. Position the CPU above the socket such that the CPU corner with the gold triangle matches the socket corner with a small triangle.
4. Carefully insert the CPU into the socket until it fits in place.

The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to prevent bending the pins and damaging the CPU!

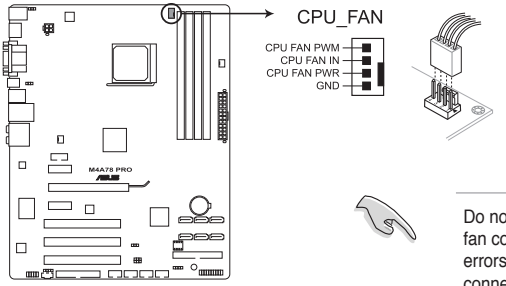


5. When the CPU is in place, push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.



6. Install a CPU heatsink and fan following the instructions that came with the heatsink package. You can also refer to section **1.6.2 Installing heatsink and fan** for instructions.

7. Connect the CPU fan cable to the CPU_FAN connector on the motherboard.



M4A78 PRO CPU fan connector

Do not forget to connect the CPU fan connector! Hardware monitoring errors can occur if you fail to plug this connector.

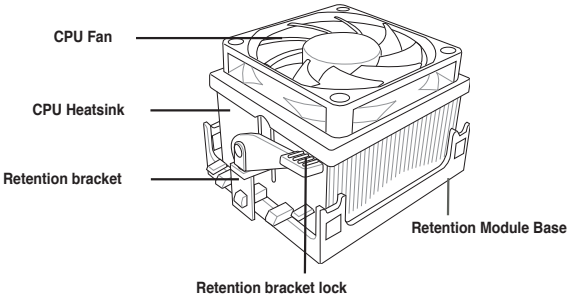
1.6.2 Installing the heatsink and fan

Ensure that you use only AMD-certified heatsink and fan assembly.

To install the CPU heatsink and fan:

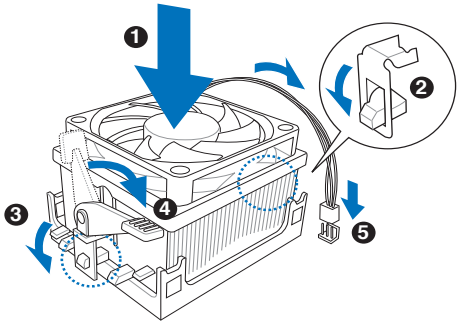
1. Place the heatsink on top of the installed CPU, making sure that the heatsink fits properly on the retention module base.

- The retention module base is already installed on the motherboard upon purchase.
- You do not have to remove the retention module base when installing the CPU or installing other motherboard components.
- If you purchased a separate CPU heatsink and fan assembly, ensure that a Thermal Interface Material is properly applied to the CPU heatsink or CPU before you install the heatsink and fan assembly.



Your boxed CPU heatsink and fan assembly should come with installation instructions for the CPU, heatsink, and the retention mechanism. If the instructions in this section do not match the CPU documentation, follow the latter.

2. Attach one end of the retention bracket to the retention module base.



3. Align the other end of the retention bracket to the retention module base. A clicking sound denotes that the retention bracket is in place.

Ensure that the fan and heatsink assembly perfectly fits the retention mechanism module base, otherwise you cannot snap the retention bracket in place.

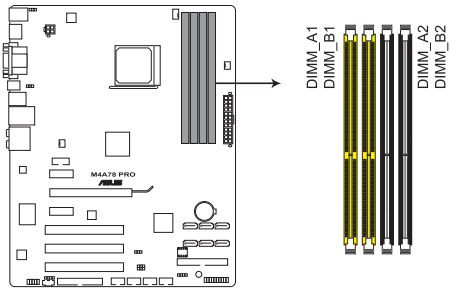
4. Push down the retention bracket lock on the retention mechanism to secure the heatsink and fan to the module base.
5. When the fan and heatsink assembly is in place, connect the CPU fan cable to the connector on the motherboard labeled CPU_FAN.

Do not forget to connect the CPU fan connector! Hardware monitoring errors can occur if you fail to plug this connector.

1.7 System memory

1.7.1 Overview

The motherboard comes with two Double Data Rate 2 (DDR2) Dual Inline Memory Modules (DIMM) sockets. A DDR2 module has the same physical dimensions as a DDR DIMM but has a 240-pin footprint compared to the 184-pin DDR DIMM. DDR2 DIMMs are notched differently to prevent installation on a DDR DIMM socket. The figure illustrates the location of the DDR2 DIMM sockets:



M4A78 PRO 240-pin DDR2 DIMM sockets

Channel	Sockets
Channel A	DIMM_A1 and DIMM_A2
Channel B	DIMM_B1 and DIMM_B2

1.7.2 Memory configurations

You may install 512MB, 1GB, 2GB and 4GB unbuffered ECC/non-ECC DDR2 DIMMs into the DIMM sockets.

- You may install varying memory sizes in Channel A and Channel B. The system maps the total size of the lower-sized channel for the dual-channel configuration. Any excess memory from the higher-sized channel is then mapped for single-channel operation.
- Always install DIMMs with the same CAS latency. For optimum compatibility, we recommend that you obtain memory modules from the same vendor.
- Due to the memory address limitation on 32-bit Windows OS, when you install 4GB or more memory on the motherboard, the actual usable memory for the OS can be about 3GB or less. For effective use of memory, we recommend that you install a 64-bit Windows OS when having 4GB or more memory installed on the motherboard.
- This motherboard does not support DIMMs made up of 256 megabit (Mb) chips or less.

- The default memory operation frequency is dependent on its SPD. Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value.
- For system stability, use a more efficient memory cooling system to support a full memory load (4 DIMMs) or overclocking condition.

M4A78 PRO Motherboard Qualified Vendors Lists (QVL)

DDR2-1066MHz capability

Vendor	Part No.	Size	SS/ DS	Chip No.	CL	Chip Brand	DIMM socket support (Optional)		
							A*	B*	C*
A-DATA	Heat-Sink Package	2GB (kit of 2)	SS	AD21066E001GU	5-5-5-15	N/A			•
A-DATA	Heat-Sink Package	4GB (kit of 2)	DS	AD21066E002GU	5-5-5-15	N/A			•
Apacer	78.0AG9S.9K4	2GB (kit of 2)	DS	Heat-Sink Package	5-5-5-15	NA	•		•
Apacer	78.AAGAL.9KZ	4GB (kit of 2)	DS	Heat-Sink Package	5-5-5-15	NA	•		•
G.SKILL	F2-8500CL5D-2GBPK	2GB (kit of 2)	DS	Heat-Sink Package	5-5-5-15	N/A	•	•	•
G.SKILL	F2-8500CL5D-4GBPK	4GB (kit of 2)	DS	Heat-Sink Package	5-5-5-15	N/A			•
G.SKILL	F2-8500CL5S-1GBPK	2GB	DS	Heat-Sink Package	5-5-5-15	G.SKILL	•	•	•
GEIL	GB24GB8500C5QC	2GB	SS	GL2L128M88BA25AB	5	GEIL	•	•	•
GEIL	GE22GB1066C5DC	2GB	SS	Heat-Sink Package	5	GEIL	•		•
GEIL	GE24GB1066C5QC	2GB	DS	Heat-Sink Package	5	GEIL	•		•
GEIL	GX24GB8500C5UDC	4GB (kit of 2)	DS	Heat-Sink Package	5	N/A	•		•
Kingmax	KLED48F-A8K15	2GB	DS	KKA8FFIXF-JFS-18A	N/A	Kingmax	•	•	•
Kingston	KHX8500D2/ 512	512MB	SS	Heat-Sink Package	N/A	Kingston	•	•	•
Kingston	KHX8500D2K2/1GN	512MB	SS	Heat-Sink Package	N/A	Kingston	•	•	•
Kingston	Heat-Sink Package	2GB	DS	KHX8500AD2/2G	7-7-7-20	N/A			•
Kingston	KHX8500D2K2/2GN	2GB	DS	Heat-Sink Package	N/A	Kingston			•
OCZ	OCZ2N1066SR2DK	2GB (kit of 2)	DS	Heat-Sink Package(EPP)	5-5-5-15	OCZ			•
Qimonda	HYS64T128000EU-1.9-C2	2GB	DS	HYB18T1G800C2F-1.9FSS25253	N/A	Qimonda			•
Transcend	TX1066QLU-2GK	2GB (kit of 2)	SS	Heat-Sink Package	5	Transced	•		•
Transcend	TX1066QLJ-2GK	2GB	DS	Heat-Sink Package	5	Transced	•		•
Transcend	TX1066QLU-4GK	4GB (kit of 2)	DS	Heat-Sink Package	5	Transced	•		•

Due to AM2+ CPU limitation, only one DDR2 1066 DIMM is supported per channel.When four DDR2 1066 DIMMs are installed, all DIMMs run at 800Mhz frequency by default for system stability.

DDR2-800MHz capability

Vendor	Part No.	Size	SS/ DS	Chip No.	CL	Chip Brand	DIMM socket support (Optional)		
							A*	B*	C*
A-Data	AD2800E001GOU	2GB (kit of 2)	SS	Heat-Sink Package	4-4-4-12	N/A	•	•	•
A-Data	M2OAD6G3H3160Q1E58	512MB	SS	AD29608A8A-25EG80812	N/A	ADATA	•	•	•
A-Data	AD2800E002GOU	4GB (kit of 2)	DS	Heat-Sink Package	4-4-4-12	N/A	•	•	•
A-Data	M2OAD6G314170Q1E58	1GB	DS	AD29608A8A-25EG80810	N/A	ADATA	•	•	•
Apacer	78.01GA0.9K5	1GB	SS	AM4B5808CQJS8E0749D	5	Apacer	•	•	

DDR2-800MHz capability (continued)

Vendor	Part No.	Size	SS/ DS	Chip No.	CL	Chip Brand	DIMM socket support (Optional)		
							A*	B*	C*
Apacer	78.A1GA0.9K4	2GB	DS	AM4B5808CQJS8E0740E	5	Apacer	•	•	•
Corsair	CM2X2048-6400C5	4GB (kit of 2)	DS	Heat-Sink Package	5	Corsair	•	•	•
Corsair	XMS2-6400	1GB	DS	Heat-Sink Package	4	Corsair	•	•	•
Crucial	BL12864AA804.8FE5	2GB (kit of 2) (EPP)	SS	Heat-Sink Package	N/A	N/A	•	•	•
Crucial	BL12864AL804.8FE5	2GB (kit of 2) (EPP)	SS	Heat-Sink Package	4	N/A	•	•	•
Elixir	M2Y1G64TU88D5B-AC 0828.GS	1GB	SS	N2TU16800E-AC	N/A	Elixir	•	•	•
Elixir	M2Y1G64TU8HB0B-25C	1GB	DS	N2TU 51280BE-25C802006Z1DV	5	Elixir	•	•	•
Elixir	M2Y2G64TU8HD5B-AC 0826.SG	2GB	DS	N2TUG80DE-AC	N/A	Elixir	•	•	
G.SKILL	F2-6400CL5D-1GBNQ	1GB (kit of 2)	SS	Heat-Sink Package	5-5-5-15	G.SKILL	•	•	•
G.SKILL	F2-6400CL4D-2GBPK	1GB	DS	Heat-Sink Package	4	G.SKILL	•	•	•
G.SKILL	F2-6400CL4D-4GBPK	2GB	DS	Heat-Sink Package	4	G.SKILL	•	•	•
G.SKILL	F2-6400CL5D-2GBNQ	1GB	DS	Heat-Sink Package	5	G.SKILL	•	•	•
G.SKILL	F2-6400CL5D-4GBPQ	2GB	DS	Heat-Sink Package	5	G.SKILL	•	•	•
G.SKILL	F2-6400CL5Q-16GNQ	4GB	DS	Heat-Sink Package	5	G.SKILL	•	•	•
GEIL	GB22GB6400C4DC	1GB	DS	GL2L64M088BA30EB	4	GEIL	•	•	•
GEIL	GB22GB6400C5DC	1GB	DS	GL2L64M088BA30EB	5	GEIL	•	•	•
GEIL	GB24GB6400C4QC	1GB	DS	GL2L64M088BA30EB	4	GEIL	•	•	•
GEIL	GB24GB6400C5DC	2GB	DS	GL2L128M88BA25AB	5	GEIL	•	•	•
GEIL	GB24GB6400C5QC	1GB	DS	GL2L64M088BA30EB	5	GEIL	•	•	•
GEIL	GB28GB6400C4QC	2GB	DS	GL2L128M88BA25AB	4	GEIL	•	•	•
GEIL	GB28GB6400C5QC	2GB	DS	GL2L128M88BA25AB	5	GEIL	•	•	•
GEIL	GE22GB800C4DC	1GB	DS	Heat-Sink Package	4	GEIL	•	•	•
GEIL	GE22GB800C5DC	1GB	DS	Heat-Sink Package	5	GEIL	•	•	•
GEIL	GE24GB800C4DC	2GB	DS	Heat-Sink Package	4	GEIL	•	•	•
GEIL	GE24GB800C4QC	1GB	DS	Heat-Sink Package	4	GEIL	•	•	•
GEIL	GE24GB800C5DC	2GB	DS	Heat-Sink Package	5	GEIL	•	•	•
GEIL	GE24GB800C5QC	1GB	DS	Heat-Sink Package	5	GEIL	•	•	
GEIL	GE28GB800C4QC	2GB	DS	Heat-Sink Package	4	GEIL	•	•	•
GEIL	GE28GB800C5QC	2GB	DS	Heat-Sink Package	5	GEIL	•	•	•
GEIL	GX22GB6400DC	1GB	DS	Heat-Sink Package	5	GEIL	•	•	•
GEIL	GX24GB6400DC	2GB	DS	Heat-Sink Package	5	GEIL	•	•	•
HY	HYMP564U64CP8-S5 AB	512MB	SS	HY5PS12821CFP-S5	5	Hynix	•	•	•
HY	HYMP 512U64CP8-S5 AB	1GB	DS	HY5PS12821CFPS5	5	Hynix	•	•	•
Kingmax	KLDD48F-B8KB5	1GB	SS	KKB8FFBGXF-CFA-25U	N/A	Kingmax	•	•	•
Kingmax	KLDE88F-B8KB5	2GB	DS	KKB8FFBGXF-CFA-25U	N/A	Kingmax	•	•	•

DDR2-800MHz capability (continued)

Vendor	Part No.	Size	SS/ DS	Chip No.	CL	Chip Brand	DIMM socket support (Optional)		
							A*	B*	C*
Kingston	KHX6400D2LLK2/1GN	512MB	SS	Heat-Sink Package	N/A	Kingston	•	•	•
Kingston	KVR800D2N5/ 512	512MB	SS	E5108AJBG-8E-E 0803A9082	N/A	Kingston	•	•	•
Kingston	KVR800D2N6/ 512	512MB	SS	E5108AJBG-8E-E	N/A	Elpida	•		
Kingston	KHX6400D2/2G	2GB	DS	Heat-Sink Package	N/A	Kingston	•	•	•
Kingston	KHX6400D2K2/2G	2GB (kit of 2)	DS	Heat-Sink Package	N/A	Kingston	•		
Kingston	KHX6400D2LL/1G	1GB	DS	Heat-Sink Package	N/A	Kingston	•	•	•
kingston	KVR800D2N5/1G	1GB	DS	D6408TR4CGL25USL3624 06PECXA	N/A	kingston	•	•	•
Kingston	KVR800D2N5/2G	2GB	DS	E1108ACBG-8E-E	N/A	Elpida	•	•	•
Kingston	KVR800D2N6/2G	2GB	DS	461625.010819 PTGC	N/A	Kingston	•	•	•
Micron	MT9HTF12872AY-800E1	1GB	SS	D9HNP 7YE22(ECC)	6	Micron	•	•	•
Micron	MT9HTF6472AY-80ED4	512MB	SS	6ED22D9GKX(ECC)	5	Micron	•	•	•
Micron	MT18HTF12872AY-80ED4	1GB	DS	6TD22D9GKX(ECC)	5	Micron	•	•	
OCZ	OCZ2G800R22GK	1GB	DS	Heat-Sink Package	5	OCZ	•	•	•
OCZ	OCZ2P8004GK	2GB	DS	Heat-Sink Package	5	OCZ	•	•	•
OCZ	OCZ2P800R22GK	1GB	DS	Heat-Sink Package	4	OCZ	•	•	•
OCZ	OCZ2RPR8002GK	1GB	DS	Heat-Sink Package	4	OCZ	•	•	•
OCZ	OCZ2VU8004GK	1GB	DS	Heat-Sink Package	6	OCZ	•	•	
PSC	AL7E8E63H-10E1K	2GB	DS	A3R1GE3CFF750RABBP(ECC)	5	PSC	•	•	•
PSC	AL8E8F73C-8E1	2GB	DS	A3R1GE3CFF734MAA0E	5	PSC	•	•	•
PSC	PL8E8F73C-8E1	2GB	DS	SHG772-AA3G	N/A	psc	•	•	•
PSC	PL8E8G73E-8E1	2GB	DS	XCP271A3G-A	N/A	psc	•	•	•
Samsung	M378T2863QZS-CF7	1GB	SS	K4T1G084QQ-HCF7	6	Samsung	•	•	•
Samsung	M378T6553GZS-CF7	512MB	SS	K4T51083QG-HCF7	6	Samsung	•	•	•
Samsung	M391T2863QZ3-CF7	1GB	SS	K4T1G084QQ-HCF7(ECC)	6	Samsung	•	•	•
Samsung	M378T5263AZ3-CF7	4GB	DS	K4T2G084QA-HCF7	N/A	Samsung	•	•	•
Transcend	JM800QLU-1G	1GB	SS	TQ1243PCF8	5	Transcend	•	•	•
Transcend	TS128MLQ64V8U	1GB	SS	E1108ACBG-8E-E	5	Elpaid	•	•	•
Transcend	TS64MLQ64V8J	512MB	SS	7HD22 D9GMH	5	Micron	•	•	•
Transcend	JM800QLJ-1G	1GB	DS	TQ123PJF8F0801	5	Transcend	•	•	•
Transcend	JM800QLU-2G	2GB	DS	TQ243PCF8	5	Transcend	•	•	
Transcend	TS128MLQ64V8J	1GB	DS	7HD22D9GMH	5	Mircon	•	•	•
Transcend	TS256MLQ64V8U	2GB	DS	E1108ACBG-8E-E	5	Elpida	•	•	•
Transcend	TS256MLQ72V8U	2GB	DS	E1108ACBG-8E-E(ECC)	N/A	Elpida	•	•	•
VDATA	M2GVD6G3H3160Q1E52	512MB	SS	VD29608A8A-25EG20813	N/A	VDATA	•	•	•
Samsung	M391T5663QZ3-CF7	2GB	DS	K4T1G084QQ-HCF7(ECC)	6	Samsung	•	•	•

DDR2-667MHz capability

Vendor	Part No.	Size	SS/ DS	Chip No.	CL	Chip Brand	DIMM socket support (Optional)		
							A*	B*	C*
ADATA	M2OAD5G314170Q1C58	1GB	DS	AD29608A8A-3EG80814	N/A	ADATA	•	•	•
ADATA	M2OAD5H3J4170I1C53	2GB	DS	AD20908A8A-3EG 30724	N/A	ADATA	•	•	•
Apacer	78.01G9O.9K5	1GB	SS	AM4B5808CQJS7E0751C	5	Apacer	•	•	•
Apacer	78.91G92.9K5	512MB	SS	AM4B5708JQJS7E0751C	5	Apacer	•	•	•
Apacer	AU 512E667C5KBGC	512MB	SS	AM4B5708GQJS7E06332F	5	Apacer	•		
Apacer	78.A1G9O.9K4	2GB	DS	AM4B5808CQJS7E0749B	5	Apacer	•	•	•
Apacer	AU01GE667C5KBGC	1GB	DS	AM4B5708GQJS7E0636B	N/A	Apacer	•	•	•
Corsair	XMS2-5400	1GB	DS	Heat-Sink Package	4	Corsair	•	•	•
G.SKILL	F2-5300CL5D-4GBMQ	4GB (kit of 2)	DS	Heat-Sink Package	5-5-5-15	G.SKILL	•	•	•
G.SKILL	F2-5400PHU2-2GBNT	2GB (kit of 2)	DS	D2 64M8CCF 0815 C7173S	5-5-5-15	G.SKILL	•	•	•
GEIL	GX22GB5300LX	2GB	DS	Heat-Sink Package	5	GEIL	•	•	•
GEIL	GX24GB5300LDC	2GB	DS	Heat-Sink Package	5	GEIL	•	•	•
Kingmax	KLCC28F-A8KB5	512MB	SS	KKEA88B4LAUG-29DX	N/A	Kingmax	•	•	•
Kingmax	KLCD48F-A8KB5	1GB	DS	KKEA88B4LAUG-29DX	N/A	Kingmax	•	•	•
Kingston	KVR667D2N5/ 512	512MB	SS	SO1237650821 SBP D6408TR4 CGL25USL074905PECNB	N/A	Kingston	•	•	•
Kingston	KVR667D2N5/1G	1GB	DS	SO1280420822 SOP D6408TR4 CGL25USL156304PECXA	N/A	Kingston	•	•	•
Kingston	KVR667D2N5/2G	2GB	DS	7RE22 D9HNL	N/A	Micron	•	•	•
Kingston	KVR667D2N5/2G	2GB	DS	E1108ACBG-8E-E 0813A90CC	N/A	Elpida	•	•	•
Nanya	NT 512T64U88A1BY-3C	512MB	SS	NT5TU64M8AE-3C	N/A	Nanya	•	•	•
Nanya	NT1GT64U8HB0BY-3C	1GB	DS	NT5TU64M8BE-3C72155700CP	5	Nanya	•	•	•
PSC	AL6E8E63J-6E1	512MB	SS	A3R12E3JFF717B9A00	5	PSC	•	•	•
PSC	AL7E8F73C-6E1	1GB	SS	A3R1GE3CFF734MAA0J	5	PSC	•	•	•
PSC	AL7E8E63J-6E1	1GB	DS	A3R12E3JFF717B9A01	5	PSC	•	•	•
Qimonda	HYS64T64000EU-3S-B2	512MB	SS	HYB18T 512B00B2F3SFSS28171	5	Qimonda	•	•	•
Qimonda	HYS64T128020EU-3S-B2	1GB	DS	HYB18T 512B00B2F3SFSS28171	5	Qimonda	•	•	•
Samsung	M378T5263AZ3-CE6	4GB	DS	K4T2G084QA-HCE6	N/A	Samsung	•	•	•
Super Talent	T667UB1GV	1GB	DS	PG 64M8-800 0750	5	Super Talent	•	•	•
Transcend	JM667QLJ-1G	1GB	DS	E5108AJBG-6E-E	5	Elpida	•	•	•
Twinmos	8D-A3JK5MPETP	512MB	SS	A3R12E3GEF633ACAOY	5	PSC	•	•	•
ELIXIR	M2Y1G64TU8HA2B-3C	1GB	DS	M2TU 51280AE-3C717095R28F	5	ELIXIR	•	•	
ELIXIR	M2Y1G64TU8HBOB-3C	1GB	DS	N2TU 51280BE-3C639009W1CF	5	ELIXIR	•	•	•
Leadmax	LRMP 512U64A8-Y5	1GB	DS	HY5PS12821CFP-Y5 C 702AA	N/A	Hynix	•	•	•
Kingston	KVR667D2E5/1G	1GB	DS	E5108AJBG-8E-E(ECC)	5	Elpida	•	•	•
Kingston	KVR667D2E5/2G	2GB	DS	NT5TU128M8DE-3C(ECC)	5	Elpida	•	•	•

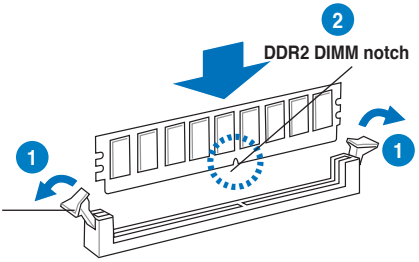
Side(s): SS - Single-sided DS - Double-sided
DIMM support:
- **A*:** Supports one module inserted into either slot as Single-channel memory configuration.
- **B*:** Supports two modules inserted into either the yellow slots or the black slots as one pair of Dual-channel memory configuration.
- **C*:** Supports four modules inserted into both the yellow slots and the black slots as two pairs of Dual-channel memory configuration.

Visit the ASUS website for the latest QVL.

1.7.3 Installing a DIMM

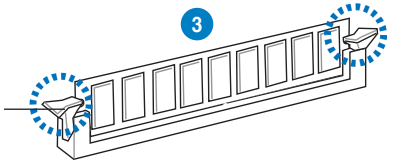
Unplug the power supply before adding or removing DIMMs or other system components. Failure to do so can cause severe damage to both the motherboard and the components.

1. Press the retaining clips outward to unlock a DDR2 DIMM socket.
2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.



A DDR2 DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.

3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



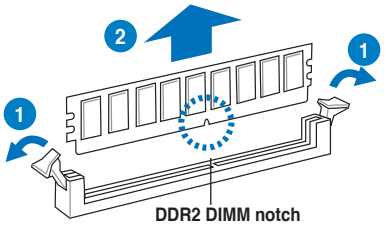
1.7.4 Removing a DIMM

To remove a DIMM:

1. Simultaneously press the retaining clips outward to unlock the DIMM.

Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2. Remove the DIMM from the socket.



1.8 Expansion slots

In the future, you may need to install expansion cards. The following sub-sections describe the slots and the expansion cards that they support.

Unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.

1.8.1 Installing an expansion card

To install an expansion card:

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.
2. Remove the system unit cover (if your motherboard is already installed in a chassis).
3. Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.
4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
5. Secure the card to the chassis with the screw you removed earlier.
6. Replace the system cover.

1.8.2 Configuring an expansion card

After installing the expansion card, configure it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 2 for information on BIOS setup.
2. Assign an IRQ to the card.
3. Install the software drivers for the expansion card.

When using PCI cards on shared slots, ensure that the drivers support “Share IRQ” or that the cards do not need IRQ assignments. Otherwise, conflicts will arise between the two PCI groups, making the system unstable and the card inoperable. Refer to the table on the next page for details.

1.8.3 PCI slots

The PCI slots support cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications.

1.8.4 PCI Express x1 slots

This motherboard supports PCI Express x1 network cards, SCSI cards, and other cards that comply with the PCI Express specifications.

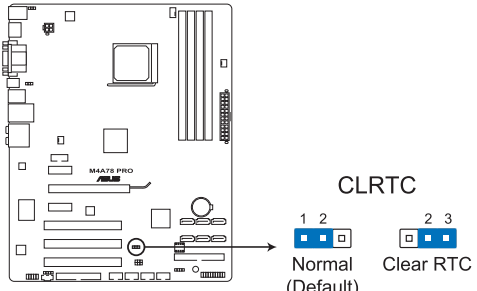
1.8.5 PCI Express x16 slot

This motherboard supports a PCI Express x16 graphics card that complies with the PCI Express specifications.

1.9 Jumpers

1. Clear RTC RAM (CLRTC)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.



M4A78 PRO Clear RTC RAM

To erase the RTC RAM

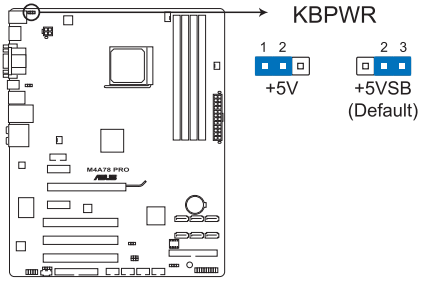
1. Turn OFF the computer and unplug the power cord.
2. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
3. Plug the power cord and turn ON the computer.
4. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!

- If the steps above do not help, remove the onboard battery and move the jumper again to clear the CMOS RTC RAM data. After the CMOS clearance, reinstall the battery.
- You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.
- Due to the chipset behavior, AC power off is required to enable C.P.R. function. You must turn off and on the power supply or unplug and plug the power cord before rebooting the system.

2. Keyboard power (3-pin KBPWR)

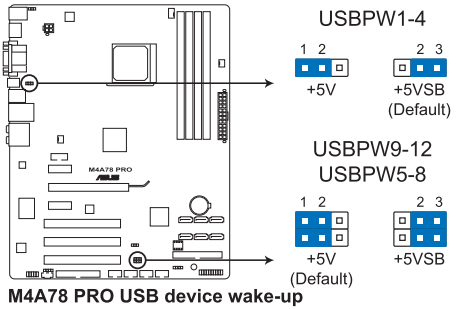
This jumper allows you to enable or disable the keyboard wake-up feature. Set this jumper to pins 2-3 (+5VSB) to wake up the computer by pressing a key on the keyboard (the default is the Space Bar). This feature requires an ATX power supply that can supply at least 1A on the +5VSB lead, and a corresponding setting in the BIOS.



M4A78 PRO Keyboard power setting

3. USB device wake-up (3-pin USBPW1-4, USBPW5-8, USBPW9-12)

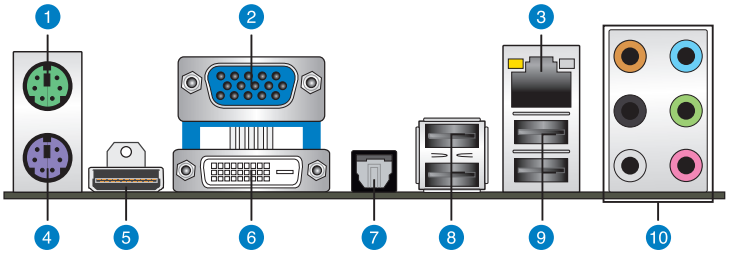
Set these jumpers to +5V to wake up the computer from S1 sleep mode (CPU stopped, DRAM refreshed, system running in low power mode) using the connected USB devices. Set to +5VSB to wake up from S3 and S4 sleep modes (no power to CPU, DRAM in slow refresh, power supply in reduced power mode). The USBPW1-4 jumpers are for the rear USB ports. The USBPW5-8 and USBPW9-12 jumpers are for the internal USB connectors that you connect to additional USB ports.



M4A78 PRO USB device wake-up

1.10 Connectors

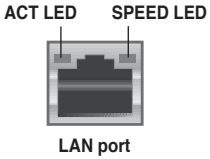
1.10.1 Rear panel connectors



1. **PS/2 mouse port.** This port is for a PS/2 mouse.
2. **Video Graphics Adapter (VGA) port** This 15-pin port is for a VGA monitor or other VGA-compatible devices.
3. **LAN (RJ-45) port.** This port allows Gigabit connection to a Local Area Network (LAN) through a network hub.

LAN port LED indications

Activity LED		Speed LED	
Status	Description	Status	Description
OFF	No link	OFF	10 Mbps connection
OFF	Linked	ORANGE	100 Mbps connection
BLINKING	Data activity	GREEN	1 Gbps connection



4. **PS/2 keyboard port.** This port is for a PS/2 keyboard.
5. **HDMI Out port.** This port is for a high-definition multimedia interface (HDMI) connector.
6. **DVI-I Out port.** This port is for any DVI-I compatible device and are HDCP compliant, allowing playback of HD DVD, Blu-Ray and other protected content.
7. **Optical S/PDIF Out port.** This port connects an external audio output device via an optical S/PDIF cable.
8. **USB 2.0 ports 3 and 4.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
9. **USB 2.0 ports 1 and 2.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
10. **8-channel audio ports.** These ports connects to a multi-speaker audio system.

Audio 2, 4, 6-channel configuration

Port	Headset 2-channel	4-channel	6-channel	8-channel
Light Blue	Line In	Line In	Line In	Line In
Lime	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Mic In	Mic In
Orange	–	–	Center/Subwoofer	Center/Subwoofer
Black	–	Rear Speaker Out	Rear Speaker Ou	Rear Speaker Out
Gray	–	–	–	Side Speaker Out

Dual display table

This table indicates whether the dual display you want to use is supported or not.

Dual display output	Support	Not support
DVI + D-Sub	•	
HDMI + D-Sub	•	
DVI + HDMI		•

Playback of HD DVD and Blu-Ray Discs

For better playback quality, we suggest that you follow the system requirements in the suggested list below.

Suggested list	
CPU	**AMD® Athlon 4400+**
DIMM	**DDR2 800 (1GB or higher)**
BIOS setup	**Frame Buffer Size--256MB or higher**
Playback software	**CyberLink® PowerDVD 7.3 (not supporting video acceleration)**

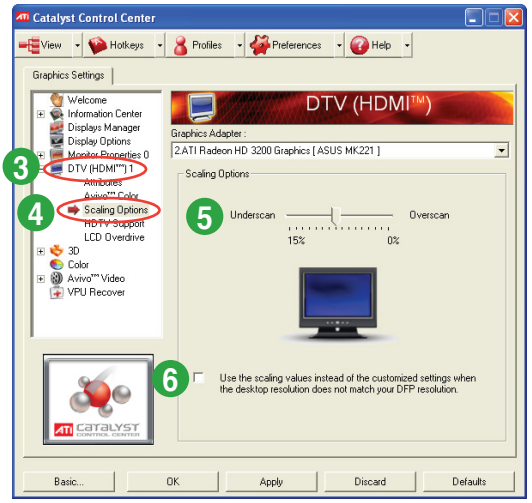
File format	Best resolution	
	Windows XP	Windows Vista
Non-protected clips	1920 x 1080p	1920 x 1080p
HD-DVD	1920 x 1080p	1280 x 1080p
Blu-Ray	1280 x 1080p	1280 x 1080p

Troubleshooting on HDTV overscaling or underscaling:

If your desktop is extending beyond the viewable display area or the desktop or image is not filling the entire display area while using the onboard HDMI out port and the HDMI cable, you can resize the desktop appearing on your HDTV screen.

To resize your HDTV desktop:

1. Install **AMD Chipset Driver** from the motherboard support DVD.
2. Right-click the desktop and select **ATI CATALYST(R) Control Center**.
3. From the **Graphics Settings** tree, expand **DTV (HDMI™) 1**.
4. Click **Scaling Options**.
5. Move the **Underscan/Overscan** slider to adjust the overall size of the display on the HDMI™ DTV.
   Using this slider increases or decreases any black borders that may be visible around the outside of the display.



6. To ensure that forcing a custom display mode through the ATI Displays Manager does not create conflicting resolutions, select the **Use the scaling values instead of the customized settings when the desktop resolution does not match your DFP resolution** check box.

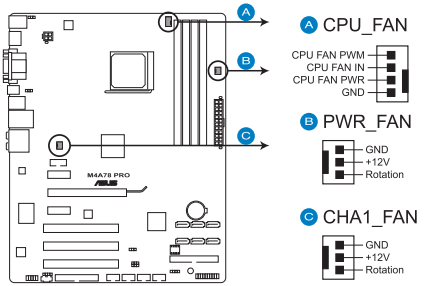
The **Scaling Options** function of the **DTV (HDMI™) 1** item in the ATI CATALYST Control Center is adjustable only when you are using an HDTV compliance resolution such as 480i, 720i, or 1080i.

1.10.2 Internal connectors

1. CPU, Chassis and Power Fan connectors (4-pin CPU_FAN, 3-pin CHA_FAN1, 3-pin PWR_FAN)

The fan connectors support cooling fans of 350mA~740mA (8.88W max.) or a total of 1A~2.22A (26.64W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, making sure that the black wire of each cable matches the ground pin of the connector.

Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors.



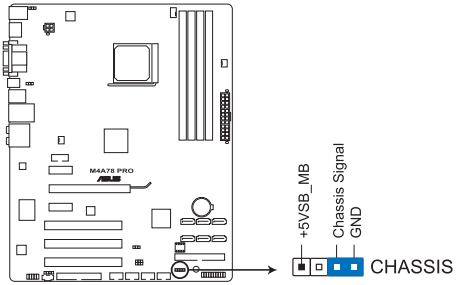
M4A78 PRO Fan connectors

Only the CPU_FAN and CHA_FAN1 connectors support the ASUS Q FAN 2 feature.

2. Chassis intrusion connector (4-1 pin CHASSIS)

This connector is for a chassis-mounted intrusion detection sensor or switch. Connect one end of the chassis intrusion sensor or switch cable to this connector. The chassis intrusion sensor or switch sends a high-level signal to this connector when a chassis component is removed or replaced. The signal is then generated as a chassis intrusion event.

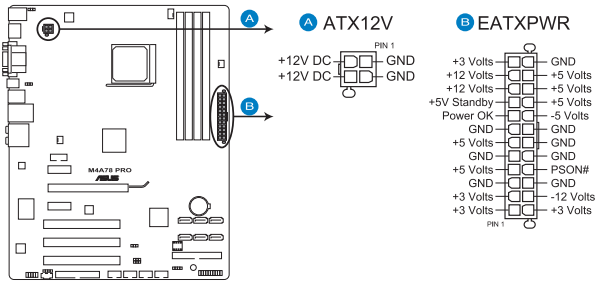
By default, the pins labeled “Chassis Signal” and “Ground” are shorted with a jumper cap. Remove the jumper caps only when you intend to use the chassis intrusion detection feature.



M4A78 PRO Chassis intrusion connector

3. ATX power connectors (24-pin EATXPWR, 4-pin ATX12V)

These connectors are for an ATX power supply. The plugs from the power supply are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

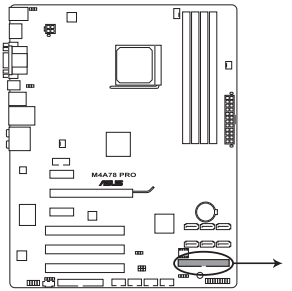


M4A78 PRO ATX power connectors

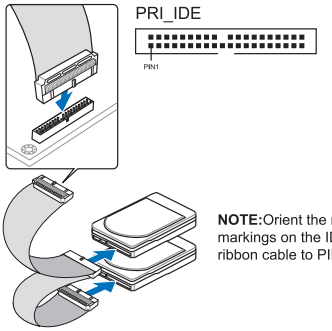
- We recommend that you use an ATX 12 V Specification 2.0-compliant power supply unit (PSU) with a minimum of 300 W power rating. This PSU type has 24-pin and 4-pin power plugs.
- If you intend to use a PSU with 20-pin and 4-pin power plugs, ensure that the 20-pin power plug can provide at least 15 A on +12 V and that the PSU has a minimum power rating of 300 W. The system may become unstable or may not boot up if the power is inadequate.
- Do not forget to connect the 4-pin ATX +12 V power plug. Otherwise, the system will not boot up.
- We recommend that you use a PSU with higher power output when configuring a system with more power-consuming devices or when you intend to install additional devices. The system may become unstable or may not boot up if the power is inadequate.
- If you are uncertain about the minimum power supply requirement for your system, refer to the Recommended Power Supply Wattage Calculator at http://support.asus.com/PowerSupplyCalculator/PSCalculator.aspx?SLanguage=en-us for details.

4. IDE connector (40-1 pin PRI_IDE)

The onboard IDE connector is for Ultra DMA 133/100/66 signal cable. There are three connectors on each Ultra DMA 133 / 100 / 66 signal cable: blue, black, and gray. Connect the blue connector to the motherboard's IDE connector, then select one of the following modes to configure your devices:



M4A78 PRO IDE connector



NOTE: Orient the red markings on the IDE ribbon cable to PIN 1.

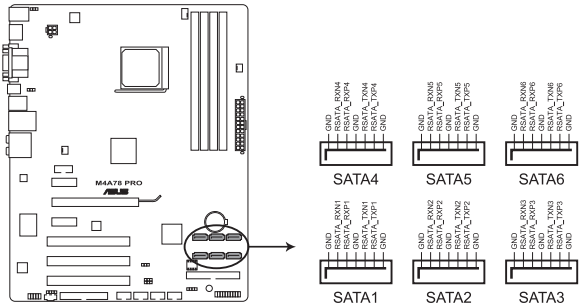
	Drive jumper setting	Mode of device(s)	Cable connector
Single device	Cable-Select or Master	-	Black
Two devices	Cable-Select	Master	Black
		Slave	Gray
	Master	Master	Black or gray
	Slave	Slave	

- Pin 20 on the IDE connector is removed to match the covered hole on the Ultra DMA cable connector. This prevents incorrect insertion when you connect the IDE cable.
- Use the 80-conductor IDE cable for Ultra DMA 133/100/66 IDE devices.

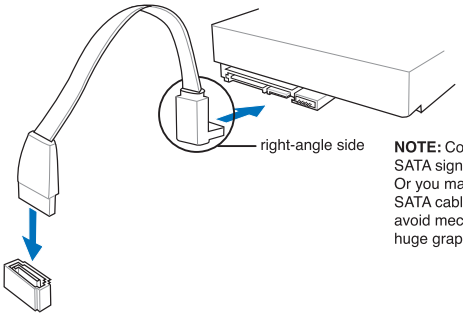
If any device jumper is set as "Cable-Select", ensure that all other device jumpers have the same setting.

5. Serial ATA connectors (7-pin SATA1-6)

These connectors are for the Serial ATA signal cables for Serial ATA 3Gb/s hard disk and optical disk drives. The Serial ATA 3Gb/s is backward compatible with Serial ATA 1.5Gb/s specification. The data transfer rate of the Serial ATA 3Gb/s is faster than the standard parallel ATA with 133 MB/s (Ultra DMA133). If you install Serial ATA hard disk drives, you can create a RAID 0, RAID 1, RAID 10 and JBOD configuration through the onboard SB700 chipset.



M4A78 PRO SATA connectors



NOTE: Connect the right-angle side of SATA signal cable to SATA device. Or you may connect the right-angle side of SATA cable to the onboard SATA port to avoid mechanical conflict with huge graphics cards.

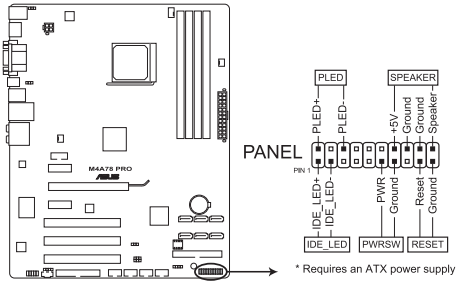
Important note on Serial ATA

Install Windows® XP Service Pack 1 or later version before using Serial ATA.

- For detailed instructions on how to configure RAID 0, RAID 1, RAID 10 and JBOD, refer to the RAID manual in the support DVD.
- If you intend to create a Serial ATA RAID set using these connectors, set the **OnChip SATA Type** item in the BIOS to **[RAID]**. See page 2-11 for details.

6. System panel connector (10-1 pin PANEL)

This connector supports several chassis-mounted functions.

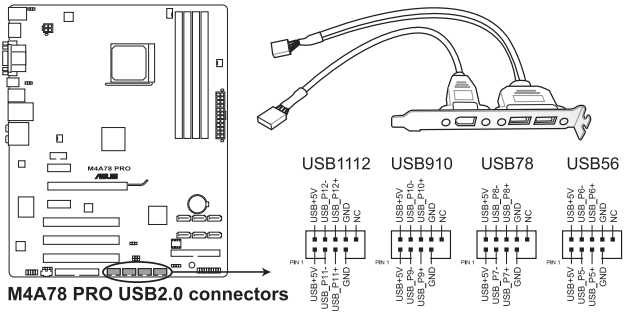


M4A78 PRO System panel connector

- **System power LED (2-pin PWRLED)**
  This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.
- **Hard disk drive activity LED (2-pin HDLED)**
  This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.
- **Power/Soft-off button (2-pin PWRBTN)**
  This 2-pin connector is for the system power button. Pressing the power button turns the system ON or puts the system in SLEEP or SOFT-OFF mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.
- **Reset button (2-pin RESET)**
  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

7. USB connectors (10-1 pin USB56, USB78, USB910, USB1112)

These connectors are for USB 2.0 ports. Connect the USB module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.



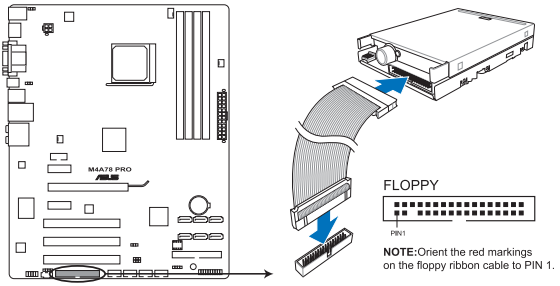
M4A78 PRO USB2.0 connectors

Never connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!

The USB 2.0 module is purchased separately.

8. Floppy disk drive connector (34-1 pin FLOPPY)

This connector is for a Floppy Disk Drive (FDD) signal cable. Insert one end of the cable to this connector, then connect the other end to the signal connector at the back of the floppy disk drive.

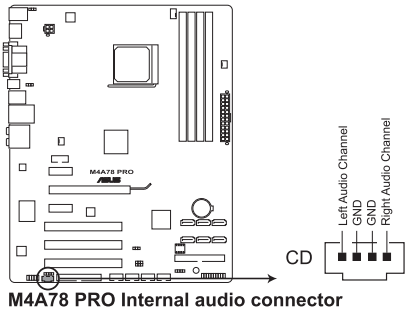


M4A78 PRO Floppy disk drive connector

- Pin 5 on the connector is removed to prevent incorrect cable connection when using an FDD cable with a covered Pin 5.
- The Floppy Disk Drive signal cable is purchased separately.

9. Optical drive audio in connector (4-pin CD)

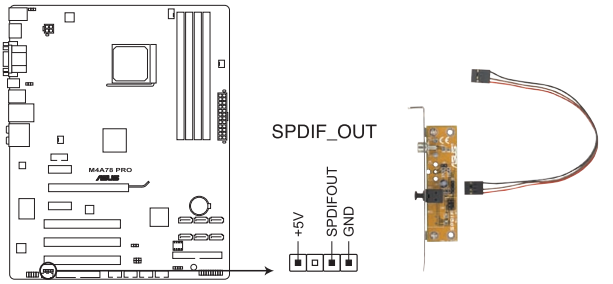
This connector allows you to receive stereo audio input from sound sources such as a CD-ROM, TV tuner, or MPEG card.



M4A78 PRO Internal audio connector

10. Digital audio connector (4-1 pin SPDIF_OUT)

This connector is for an additional Sony/Philips Digital Interface (S/PDIF) ports.

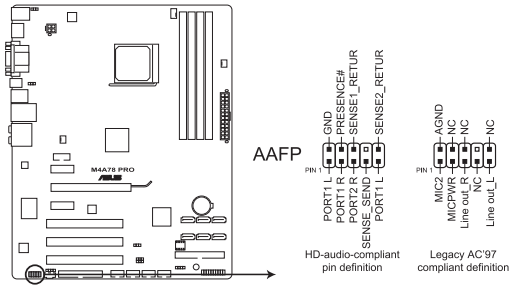


M4A78 PRO Digital audio connector

The S/PDIF module is purchased separately.

11. Front panel audio connector (10-1 pin AAFP)

This connector is for a chassis-mounted front panel audio I/O module that supports either High Definition Audio or AC`97 audio standard. Connect one end of the front panel audio I/O module cable to this connector.

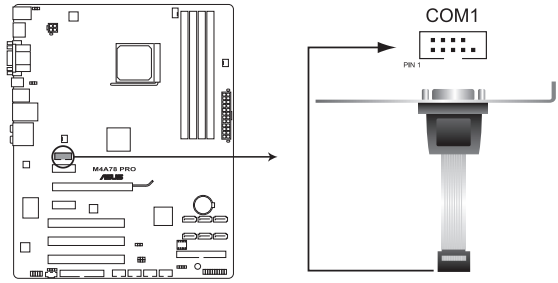


M4A78 PRO Analog front panel connector

- We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard high-definition audio capability.
- If you want to connect a high-definition front panel audio module to this connector, ensure that the **Front Panel Select** item in the BIOS is set to [HD]. If you want to connect an AC'97 front panel audio module to this connector, set the item to [AC97]. See page 2-20 for details.

12. Serial port connector (10-1 pin COM1)

The connector is for a serial (COM) port. Connect the serial port module cable to the connector, then install the module to a slot opening at the back of the system chassis.



M4A78 PRO Serial port (COM1) connector

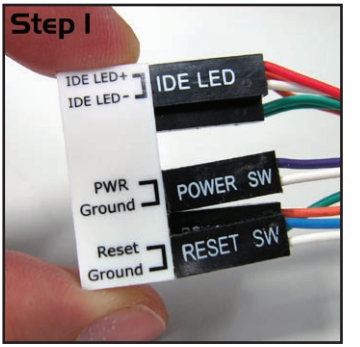
The serial port bracket (COM1) is purchased separately.

ASUS Q-Connector (system panel)

You can use the ASUS Q-Connector to connect/disconnect chassis front panel cables in a few steps. Refer to the instructions below to install the ASUS Q-Connector.

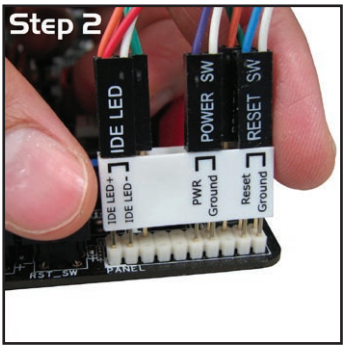
1. Connect the front panel cables to the ASUS Q-Connector.

   Refer to the labels on the Q-Connector to know the detailed pin definitions, then match them to the respective front panel cable labels.

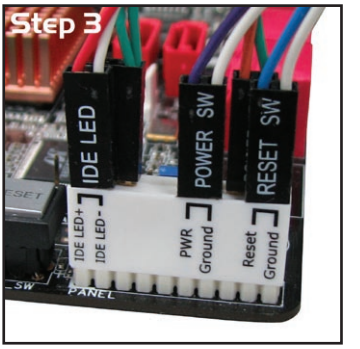


The labels of the front panel cables may differ from chassis made by different manufacturers.

2. Install the ASUS Q-Connector to the system panel connector, making sure the orientation matches the labels on the motherboard.



3. The front panel functions are now enabled. The figure shows the Q-Connector properly installed on the motherboard.



1.11 Software support

1.11.1 Installing an operating system

This motherboard supports Windows® XP/Vista Operating Systems (OS). Always install the latest OS version and corresponding updates to maximize the features of your hardware.

- Motherboard settings and hardware options vary. Use the setup procedures presented in this chapter for reference only. Refer to your OS documentation for detailed information.
- Ensure that you install Windows® XP Service Pack 1 or later versions before installing the drivers for better compatibility and system stability.

1.11.2 Support DVD information

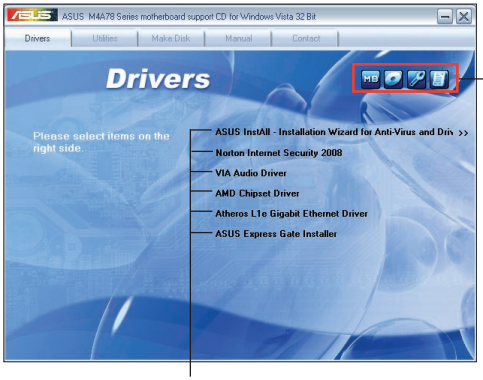
The Support DVD that comes with the motherboard package contains the drivers, software applications, and utilities that you can install to avail all motherboard features.

- The contents of the Support DVD are subject to change at any time without notice. Visit the ASUS website at www.asus.com for updates.
- For detailed software instructions, see the **Manual** menu in the Support DVD or download the latest software manual from the ASUS website at www.asus.com.

To run the Support DVD

Place the Support DVD to the optical drive. The DVD automatically displays the Drivers menu if Autorun is enabled in your computer.

The screen on the next page is used for reference only.


ASUS M4A78 Series motherboard support CD for Windows Vista 32 Bit
Drivers
Utilities
Make Disk
Manual
Contact
Drivers
Please select items on the right side.
ASUS InstAll - Installation Wizard for Anti-Virus and Driv >>
Norton Internet Security 2008
VIA Audio Driver
AMD Chipset Driver
Atheros L1e Gigabit Ethernet Driver
ASUS Express Gate Installer
Click an icon to display Support DVD/ motherboard information
Click an item to install

If Autorun is NOT enabled in your computer, browse the contents of the Support DVD to locate the file ASSETUP.EXE from the BIN folder. Double-click the ASSETUP.EXE to run the DVD.

Chapter 2

BIOS information

2.1 Managing and updating your BIOS

Save a copy of the original motherboard BIOS file to a bootable floppy disk or a USB flash disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update or AFUDOS utilities.

2.1.1 Creating a bootable floppy disk

To create a bootable floppy disk

1. Insert a formatted, high density 1.44MB floppy disk to the floppy disk drive.
2. Follow the instructions based on your system environment.

DOS environment

a. At the DOS prompt, type `format A:/S` then press **<Enter>**.

Windows® XP environment

a. From the Windows® desktop, click **Start** > **My Computer**.

b. Select the 3 1/2 Floppy Drive icon.

c. Click **File** from the menu, then select **Format**. A **Format 3 1/2 Floppy** window appears.

d. Select **Create an MS-DOS startup disk** from the format options field, then click **Start**.

Windows® Vista environment

a. From the Windows® desktop, click > **Computer**.

b. Right-click **Floppy Disk Drive** then click **Format** to display the **Format 3 1/2 Floppy** dialog box.

c. Select the **Create an MS-DOS startup disk** check box.

d. Click **Start**.

2. Copy the original or the latest motherboard BIOS file to the bootable floppy disk.

2.1.2 ASUS Update utility

The ASUS Update is a utility that allows you to manage, save, and update the motherboard BIOS in Windows® environment.

- ASUS Update requires an Internet connection either through a network or an Internet Service Provider (ISP).
- This utility is available in the support DVD that comes with the motherboard package.

Installing ASUS Update

To install ASUS Update:

1. Place the support DVD in the optical drive. The **Drivers** menu appears.
2. Click the **Utilities** tab, and then click **Install ASUS Update**.
3. Follow the onscreen instructions to complete the installation.

Quit all Windows® applications before you update the BIOS using this utility.

Updating the BIOS

To update the BIOS:

1. From the Windows® desktop, click **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate** to launch the ASUS Update utility.
2. From the dropdown list, select any of the updating process:

Updating from the Internet

a. Select **Update BIOS from the Internet**, and then click Next.

b. Select the ASUS FTP site nearest you to avoid network traffic, or click **Auto Select,** and then click **Next**.

c. From the FTP site, select the BIOS version that you wish to download, and then click **Next**.

The ASUS Update utility is capable of updating itself through the Internet. Always update the utility to avail all its features.

Updating from a BIOS file

a. Select **Update BIOS from a file**, and then click **Next**.

b. Locate the BIOS file from the **Open** window, and then click **Open**.

3. Follow the onscreen instructions to complete the updating process.

2.1.3 ASUS EZ Flash 2 utility

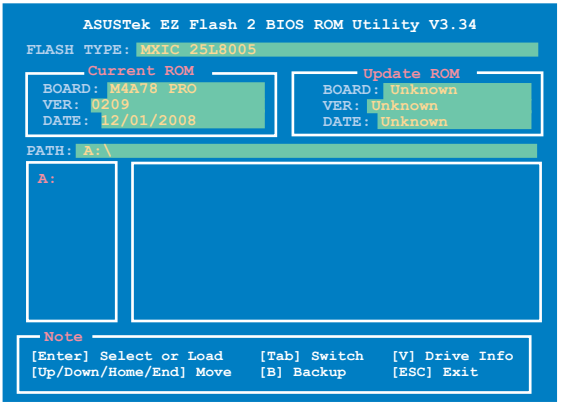
The ASUS EZ Flash 2 feature allows you to update the BIOS without having to use a bootable floppy disk or a DOS-based utility.

Download the latest BIOS file from the ASUS website at www.asus.com.

To update the BIOS using EZ Flash 2:

1. Insert the floppy/USB flash disk that contains the latest BIOS file to the floppy disk drive or the USB port, then launch EZ Flash 2. You can launch EZ Flash 2 in two ways.

   a. Press **<Alt> + <F2>** during POST to display the following:



   b. Enter the BIOS setup program. Go to the **Tools** menu to select **EZ Flash 2** and press **<Enter>** to enable it.
   Press **<Tab>** to switch between drives until the correct BIOS file is found.

4. When the correct BIOS file is found, EZ Flash 2 performs the BIOS update process and automatically reboots the system when done.

- This function can support devices such as USB flash disk, or floppy disk with **FAT 32/16** format and single partition only.
- Do not shut down or reset the system while updating the BIOS to prevent system boot failure!

2.1.4 AFUDOS utility

The AFUDOS utility allows you to update the BIOS file in DOS environment using a bootable floppy disk. This utility also allows you to copy the current BIOS file that you can use as backup when the BIOS fails or gets corrupted during the updating process.

- Ensure that you prepare two floppy disks: the bootable floppy disk and the floppy disk containing the AFUDOS utility and the latest BIOS file.
- Ensure that the floppy disk is not write-protected and has at least 1072KB to save the AFUDOS and BIOS files.
- The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be the same as shown.

Updating the BIOS file

To update the BIOS file using the AFUDOS utility:

1. Insert the bootable floppy disk into the floppy disk drive to boot the system in DOS mode.
2. Replace the bootable floppy disk and insert the floppy disk that contains the AFUDOS utility and the latest BIOS file.

- Obtain the AFUDOS utility (afudos.exe) from the bundled support DVD and the latest BIOS file from the ASUS website at www.asus.com.
- We recommend that you write the BIOS filename on a piece of paper. You will need to key in the exact BIOS filename at the DOS prompt later.

3. At the DOS prompt, key in **`afudos /i[filename]`**

   where [filename] is the BIOS file in the floppy disk.

```
A:\>afudos /iM4A78PRO.ROM
```

   Press <Enter>.

Do not shut down or reset the system while updating the BIOS to prevent system boot failure!

4. The utility returns to the DOS prompt after the BIOS updating process is completed. Reboot the system from the hard disk drive.

2.1.5 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can update a corrupted BIOS file using the motherboard support DVD, a floppy disk, or a USB flash disk that contains the updated BIOS file.

- Prepare the motherboard support DVD, the floppy disk, or the USB flash disk containing the updated motherboard BIOS before using this utility.
- For the M4A78 PRO motherboard, this utility will not function when you use a PATA optical drive.
- Always connect the SATA cable to the SATA1 / SATA 2 connector. Otherwise, the utility will not function.

Recovering the BIOS

To recover the BIOS:

1. Turn on the system.
2. Insert the floppy disk, support DVD, or USB flash disk containing BIOS file to the disk drive or port.
3. The utility displays the following message and automatically checks the floppy disk, support DVD, or USB flash disk for the BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
```

When found, the utility reads the BIOS file and starts erasing the corrupted BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy found!
Reading file "M4A78PRO.ROM". Completed.
Start erasing...
```

4. Restart the system after the utility completes the updating process.

- Only the USB flash disk with FAT 32/16 format and single partition can support ASUS CrashFree BIOS 3. The device size should be smaller than 8GB.
- DO NOT shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!

- The utility automatically checks the floppy disk first. If no floppy disk is found, the utility then checks the optical drive and the USB flash disk.
- The recovered BIOS may not be the latest BIOS version for this motherboard. Download the latest BIOS file from the ASUS website at www.asus.com.

2.2 BIOS setup program

This motherboard supports a programmable firmware chip that you can update using the provided utility described in section **2.1 Managing and updating your BIOS**.

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to "Run Setup". This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the firmware chip.

The firmware chip on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press **<Del>** during the Power-On Self-Test (POST) to enter the Setup utility. Otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, reboot the system by doing any of the following procedures:

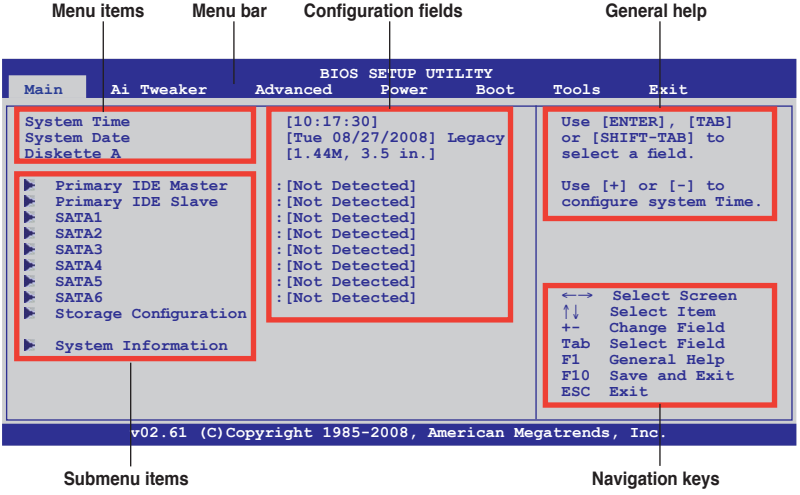
- Restart using the OS standard shut-down procedure.
- Press **<Ctrl>+<Alt>+<Del>** simultaneously.
- Press the reset button on the system chassis.
- Press the power button to turn the system off then back on.

Using the power button, reset button, or the **<Ctrl>+<Alt>+<Del>** keys to force reset from a running operating system can cause damage to your data or system. We recommend to always shut-down the system properly from the operating system.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various submenus and make your selections from the available options using the navigation keys.

- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Setups Default** item under the Exit Menu. See section **2.9 Exit Menu**.
- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
- Visit the ASUS website at www.asus.com to download the latest BIOS file for this motherboard.

2.2.1 BIOS menu screen



2.2.2 Menu bar

The menu bar on top of the screen has the following main items:

Main	For changing the basic system configuration
Ai Tweaker	For changing the overclocking settings
Advanced	For changing the advanced system settings
Power	For changing the advanced power management (APM) configuration
Boot	For changing the system boot configuration
Tools	For changing the system tools configuration
Exit	For selecting the exit options and loading default settings

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

- The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.
- Visit the ASUS website at www.asus.com to download the latest BIOS information.

2.2.3 Navigation keys

At the bottom right corner of a menu screen are the navigation keys for that particular menu. Use the navigation keys to select items in the menu and change the settings.

Some of the navigation keys differ from one screen to another.

2.2.4 Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting Main shows the Main menu items.

The other items (Advanced, Power, Boot, Tools, and Exit) on the menu bar have their respective menu items.

2.2.5 Submenu items

A solid triangle before each item on any menu screen means that the item has a submenu. To display the submenu, select the item and press <Enter>.

2.2.6 Configuration fields

These fields show the values for the menu items. If an item is user-configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press <Enter> to display a list of options. Refer to **2.2.8 Pop-up window**.

2.2.7 General help

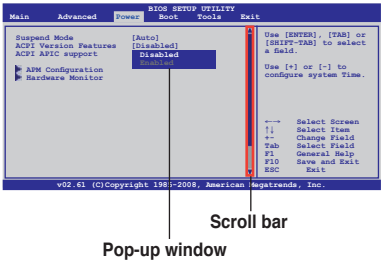
At the top right corner of the menu screen is a brief description of the selected item.

2.2.8 Pop-up window

Select a menu item then press <Enter> to display a pop-up window with the configuration options for that item.

2.2.9 Scroll bar

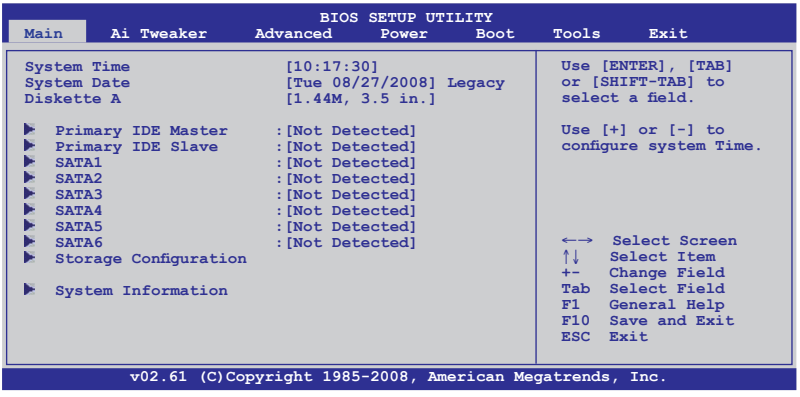
A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the <Up> / <Down> arrow keys or <Page Up> /<Page Down> keys to display the other items on the screen.



2.3 Main menu

When you enter the BIOS Setup program, the **Main** menu screen appears, giving you an overview of the basic system information.

Refer to section **2.2.1 BIOS menu screen** for information on the menu screen items and how to navigate through them.



2.3.1 System Time [xx:xx:xx]

Allows you to set the system time.

2.3.2 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

2.3.3 Legacy Diskette A [1.44M, 3.5 in.]

Sets the type of floppy drive installed.
Configuration options: [Disabled] [360K, 5.25 in.] [1.2M , 5.25 in.] [720K , 3.5 in.] [1.44M, 3.5 in.] [2.88M, 3.5 in.]

2.3.4 Primary IDE Master/Slave

While entering Setup, the BIOS automatically detects the presence of IDE devices. There is a separate submenu for each IDE device. Select a device item then press <Enter> to display the IDE device information.

The BIOS automatically detects the values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and SMART monitoring). These values are not user-configurable. These items show Not Detected if no IDE device is installed in the system.

Type [Auto]

Selects the type of IDE drive. Setting to [Auto] allows automatic selection of the appropriate IDE device type. Select [CDROM] if you are specifically configuring a CD-ROM drive. Select [ARMD] (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive.
Configuration options: [Not Installed] [Auto] [CDROM] [ARMD]

LBA/Large Mode [Auto]

Enables or disables the LBA mode. Setting to [Auto] enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled.
Configuration options: [Disabled] [Auto]

Block (Multi-Sector Transfer) M [Auto]

Enables or disables data multi-sectors transfers. When set to [Auto], the data transfer from and to the device occurs multiple sectors at a time if the device supports multi-sector transfer feature. When set to [Disabled], the data transfer from and to the device occurs one sector at a time.
Configuration options: [Disabled] [Auto]

PIO Mode [Auto]

Selects the PIO mode.
Configuration options: [Auto] [0] [1] [2] [3] [4]

DMA Mode [Auto]

Selects the DMA mode.
Configuration options: [Auto]

SMART Monitoring [Auto]

Sets the Smart Monitoring, Analysis, and Reporting Technology.
Configuration options: [Auto] [Disabled] [Enabled]

32Bit Data Transfer [Enabled]

Enables or disables 32-bit data transfer.
Configuration options: [Disabled] [Enabled]

2.3.5 SATA 1–6

While entering Setup, the BIOS automatically detects the presence of Serial ATA devices. There is a separate submenu for each SATA device. Select a device item then press <Enter> to display the SATA device information.

The BIOS automatically detects the values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and SMART monitoring). These values are not user-configurable. These items show Not Detected if no Serial ATA device is installed in the system.

LBA/Large Mode [Auto]

Enables or disables the LBA mode. Setting to [Auto] enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled.
Configuration options: [Disabled] [Auto]

Block (Multi-sector Transfer) M [Auto]

Enables or disables data multi-sectors transfers. When set to [Auto], the data transfer from and to the device occurs multiple sectors at a time if the device supports multi-sector transfer feature. When set to [Disabled], the data transfer from and to the device occurs one sector at a time.
Configuration options: [Disabled] [Auto]

PIO Mode [Auto]

Selects the PIO mode.
Configuration options: [Auto] [0] [1] [2] [3] [4]

DMA Mode [Auto]

Selects the DMA mode.
Configuration options: [Auto]

SMART Monitoring [Auto]

Sets the Smart Monitoring, Analysis, and Reporting Technology.
Configuration options: [Auto] [Disabled] [Enabled]

32Bit Data Transfer [Enabled]

Enables or disables 32-bit data transfer.
Configuration options: [Disabled] [Enabled]

2.3.6 Storage Configuration

This menu allows you to configure the SATA devices.

OnChip SATA Channel [Enabled]

Enables or disables the OnChip SATA Channel.
Configuration options: [Enabled] [Disabled]

OnChip SATA Type [IDE]

Allows you to select the SATA type.
Configuration options: [IDE] [RAID] [AHCI]

- If you want to use the Serial ATA hard disk drives as Parallel ATA physical storage devices, keep the default setting [IDE].
- If you want the Serial ATA hard disk drives to use the Advanced Host Controller Interface (AHCI), set this item to [AHCI]. The AHCI allows the onboard storage driver to enable advanced Serial ATA features that increases storage performance on random workloads by allowing the drive to internally optimize the order of commands.
- When SATA is configured as [AHCI] in BIOS, only SATA port 1-4 can be detected. Ensure to install the AHCI driver to detect and use SATA port 2-6 in AHCI mode under OS.
- If you want to create a RAID 0, RAID 1, and RAID 10 configuration from the Serial ATA hard disk drives, set this item to [RAID].

2.3.7 System Information

This menu gives you an overview of the general system specifications. The BIOS automatically detects the items in this menu.

BIOS Information

Displays the auto-detected BIOS information.

Processor

Displays the auto-detected CPU specification.

System Memory

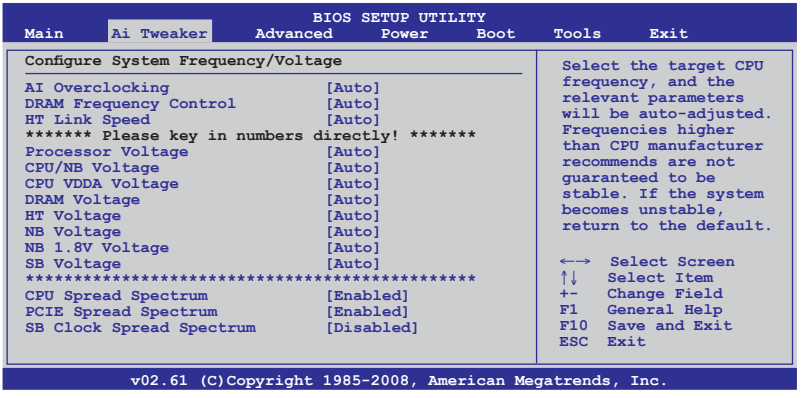
Displays the auto-detected system memory.

2.4 Ai Tweaker menu

The Ai Tweaker menu items allow you to configure overclocking-related items.

Take caution when changing the settings of the Ai Tweaker menu items. Incorrect field values can cause the system to malfunction.

The default values of the following items vary depending on the CPU and memory modules you install on the motherboard.


BIOS SETUP UTILITY
Main
Ai Tweaker
Advanced
Power
Boot
Tools
Exit
Configure System Frequency/Voltage
AI Overclocking [Auto]
DRAM Frequency Control [Auto]
HT Link Speed [Auto]
******* Please key in numbers directly! *******
Processor Voltage [Auto]
CPU/NB Voltage [Auto]
CPU VDDA Voltage [Auto]
DRAM Voltage [Auto]
HT Voltage [Auto]
NB Voltage [Auto]
NB 1.8V Voltage [Auto]
SB Voltage [Auto]
CPU Spread Spectrum [Enabled]
PCIE Spread Spectrum [Enabled]
SB Clock Spread Spectrum [Disabled]
Select the target CPU frequency, and the relevant parameters will be auto-adjusted. Frequencies higher than CPU manufacturer recommends are not guaranteed to be stable. If the system becomes unstable, return to the default.
←→ Select Screen
↑↓ Select Item
+- Change Field
F1 General Help
F10 Save and Exit
ESC Exit
v02.61 (C)Copyright 1985-2008, American Megatrends, Inc.

2.4.1 AI Overclocking [Auto]

Allows selection of CPU overclocking options to achieve desired CPU internal frequency.
Configuration options: [Manual] [Auto]

The following three (3) items appear only when you set the **Ai Overclocking** item to [Manual].

CPU Ratio [Auto]

Allows you to adjust the ratio between CPU Core Clock and FSB Frequency. Use the <+> and <-> keys to adjust the value.
Configuration options: [Auto] [8.00x] [8.50x] [9.00x] [9.50x] [10.00x] [10.50x] [11.00x]

FSB Frequency [XXX]

Displays the frequency sent by the clock generator to the system bus and PCI bus. Use the <+> and <-> keys to adjust the FSB frequency. You can also type the desired FSB frequency using the numeric keypad. The values range from 200 to 600.

PCIE Frequency [XXX]

Use the <+> and <-> keys to adjust the PCIE frequency. You can also type the desired PCIE frequency using the numeric keypad. The values range from 100 to 150.

2.4.2 DRAM Frequency Control [Auto]

Allows you to select the DRAM frequency control method.
Configuration options: [Auto] [Manual]

DRAM Frequency [667MHz]

This item appears only when you set the **Dram Frequency Control** item to [Manual] and allows you to manually set the Dram frequency.
Configuration options: [667MHz] [800MHz] [1067MHz]

CPU/NB Frequency [Auto]

This item appears only when you set the **AI Overclocking** item to [Manual] and allows selection of the CPU frequency multiplier.
Configuration options: [Auto] [4.00x] [5.00x] [6.00x] [7.00x] [8.00x] [9.00x]

2.4.3 HT Link Speed [Auto]

Allows you to set the CPU-Northbridge HyperTransport link speed.
Configuration options: [Auto] [200 MHz] [400 MHz] [600 MHz] [800 MHz] [1 GHz] [1.2 GHz] [1.4 GHz] [1.6 GHz] [1.8 GHz]

Memory Configuration

This item appears only when you set the **AI Overclocking** item to [Manual] and allows you to change the advanced memory settings.

Bank Interleaving [Auto]
Allows you to enable or disable the bank memory interleaving.
Configuration options: [Disabled] [Auto]

Channel Interleaving [XOR of Address bit [20:16, 6]]
Allows you to set the channel interleaving mode.
Configuration options: [Disabled] [Address bits 6] [Address bits 12] [XOR of Address bits [20:16, 6] [XOR of Address bits [20:16, 9]]

MemClk Tristate C3/ATLVID [Disabled]
Allows you to enable or disable MemClk Tri-Stating during C3 and Alt VID.
Configuration options: [Disabled] [Enabled]

Memory Hole Remapping [Enabled]
Allows you to enable or disable memory remapping around memory hole.
Configuration options: [Disabled] [Enabled]

DCT Unganged Mode [Auto]
Allows selection of the unganged DRAM mode.
Configuration options: [Auto] [Enabled] [Disabled]

Power Down Enable [Disabled]
Allows you to enable or disable the DDR power down mode.
Configuration options: [Disabled] [Enabled]

Power Down Mode [Channel]

Appears only when you enable the **Power Down Enable** item.
Configuration options: [Channel] [Chip Select]

DRAM Timing Configuration

This item appears only when you set the **AI Overclocking** item to [Manual] and allows you to change the advanced DRAM timing settings.

The configuration options for some of the following items vary depending on the DIMMs you install on the motherboard.

DRAM Timing Mode [Auto]

Allows selection of the DRAM Timing Mode.
Configuration options: [Auto] [Both]

The following sub-items appear only when you set the **DRAM Timing Mode** item to [Both].

DCT0 1st Information: 1-3-3-2(4)-3-11-3-2

CAS Latency (CL) [Auto]

Configuration options: [Auto] [3 CLK] [4 CLK] [5 CLK] [6 CLK] [7 CLK DH_Only]

TRCD [Auto]

Configuration options: [3 CLK] [4 CLK] [5 CLK] [6 CLK] [Auto]

TRP [Auto]

Configuration options: [3 CLK] [4 CLK] [5 CLK] [6 CLK] [Auto]

tRTP [Auto]

Configuration options: [Auto] [2-4 CLK] [3-5 CLK]

TRAS [Auto]

Configuration options: [5 CLK] [6 CLK] – [17 CLK] [18 CLK] [Auto]

TRC [Auto]

Configuration options: [11 CLK] [12 CLK] – [25 CLK] [26 CLK] [Auto]

tWR [Auto]

Configuration options: [Auto] [3 CLK] [4 CLK] [5 CLK] [6 CLK]

TRRD [Auto]

Configuration options: [2 CLK] [3 CLK] [4 CLK] [5 CLK] [Auto]

DCT0 2nd Information: 5-75-75

tWTR [Auto]

Specifies the write to read delay when accessing the same DIMM.
Configuration options: [1 CLK] [2 CLK] [3 CLK] [Auto]

tRFC0 [Auto]

Configuration options: [Auto] [75ns] [105ns] [127.5ns] [195ns] [327.5ns]

tRFC1 [Auto]

Configuration options: [Auto] [75ns] [105ns] [127.5ns] [195ns] [327.5ns]

Command Rate: 1T/2T [Auto]

Allows selection of the DRAM command rate.
Configuration options: [Auto] [1T] [2T]

DCT0/DCT1 Strength Config [Auto]

Allows adjustments of the advanced DRAM strength parameters.
Configuration options: [Auto] [DCT 0] [DCT 1] [Both]

The following sub-items appear only when you set the **DCT0/DCT1 Strength Config.** item to [DCT 0] or [Both].

DCT0:CKE drive strength. [Auto]

Configuration options: [Auto] [1x] [1.25x] [1.5x] [2x]

DCT0:CS/ODT drive strength. [Auto]

Configuration options: [Auto] [1x] [1.25x] [1.5x] [2x]

DCT0:Address/Command drive strength. [Auto]

Configuration options: [Auto] [1x] [1.25x] [1.5x] [2x]

DCT0:MEMCLK drive strength. [Auto]

Configuration options: [Auto] [0.75x] [1x] [1.25x] [1.5x]

DCT0:Data drive strength. [Auto]

Configuration options: [Auto] [0.75x] [1x] [1.25x] [1.5x]

DCT0:DQS drive strength. [Auto]

Configuration options: [Auto] [0.75x] [1x] [1.25x] [1.5x]

DCT0:Processor on-die termination [Auto]

Configuration options: [Auto] [300 ohms +/- 20%] [150 ohms +/- 20%] [75 ohms +/- 20%]

The following sub-items appear only when you set the **DCT0/DCT1 Strength Config.** item to [DCT 1] or [Both].

DCT1:CKE drive strength. [Auto]

Configuration options: [Auto] [1x] [1.25x] [1.5x] [2x]

DCT1:CS/ODT drive strength. [Auto]

Configuration options: [Auto] [1x] [1.25x] [1.5x] [2x]

DCT1:Address/Command drive strength. [Auto]

Configuration options: [Auto] [1x] [1.25x] [1.5x] [2x]

DCT1:MEMCLK drive strength. [Auto]

Configuration options: [Auto] [0.75x] [1x] [1.25x] [1.5x]

DCT1:Data drive strength. [Auto]

Configuration options: [Auto] [0.75x] [1x] [1.25x] [1.5x]

DCT1:DQS drive strength. [Auto]

Configuration options: [Auto] [0.75x] [1x] [1.25x] [1.5x]

DCT1:Processor on-die termination [Auto]

Configuration options: [Auto] [300 ohms +/- 20%] [150 ohms +/- 20%] [75 ohms +/- 20%]

The following eight (8) items are adjusted by typing the desired values using the numeric keypad and press the <Enter> key. You can also use the <+> and <-> keys to adjust the value. To restore the default setting, type [auto] using the keyboard and press the <Enter> key.

2.4.4 Processor Voltage [Auto]

Allows you to set the CPU VCore voltage.

2.4.5 CPU/NB Voltage [Auto]

Allows you to set the voltage between the CPU and Northbridge.

2.4.6 CPU VDDA Voltage [Auto]

Allows you to set the CPU VDDA voltage. The values range from 2.50V to 2.80V with a 0.10V interval.

2.4.7 DRAM Voltage [Auto]

Allows you to set the DRAM voltage. The values range from 1.90V to 2.53V with a 0.09V interval.

2.4.8 HT Voltage [Auto]

Allows you to set the HyperTransport voltage. The values range from 1.20V to 1.50V with a 0.10V interval.

2.4.9 NB Voltage [Auto]

Allows you to set the NorthBridge voltage. The values range from 1.30V to 1.60V with a 0.10V interval.

2.4.10 NB 1.8V Voltage [Auto]

Allows you to set the NorthBridge 1.8V voltage. The values range from 1.80V to 2.00V with a 0.2V interval.

2.4.11 SB Voltage [Auto]

Allows you to set the SouthBridge voltage. The values range from 1.20V to 1.35V with a 0.15V interval.

2.4.12 CPU Spread Spectrum [Enabled]

Set to [Disabled] to enhance FSB overclocking ability or [Enabled] for EMI control.
Configuration options: [Disabled] [Enabled]

2.4.13 PCIE Spread Spectrum [Enabled]

Set to [Disabled] to enhance PCIE overclocking ability or [Enabled] for EMI control.
Configuration options: [Disabled] [Enabled]

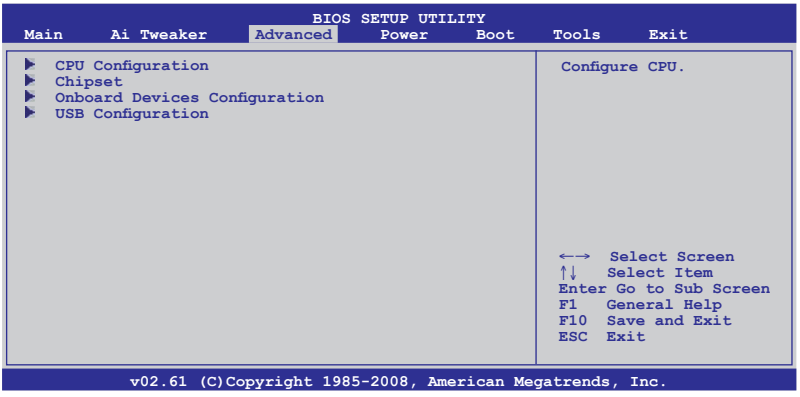
2.4.14 SB Clock Spread Spectrum [Disabled]

We recommend that you leave this item to its default setting for system stability.
Configuration options: [Disabled] [Enabled]

2.5 Advanced menu

The **Advanced** menu items allow you to change the settings for the CPU and other system devices.

Be cautious when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.



2.5.1 CPU Configuration

The items in this menu show the CPU-related information that the BIOS automatically detects.

GART Error Reporting [Disabled]

This option should remain disabled for the normal operation. The driver developer may enable it for testing purpose.
Configuration options: [Disabled] [Enabled]

Microcode Updation [Enabled]

Allows you to enable or disable the microcode updation.
Configuration options: [Disabled] [Enabled]

Secure Virtual Machine Mode [Enabled]

Allows you to enable or disable the AMD Secure Virtual Machine mode (SVM).
Configuration options: [Disabled] [Enabled]

AMD Cool'n'Quiet Function [Enabled]

Enables or disables the AMD Cool'n'Quiet function.
Configuration options: [Disabled] [Enabled]

ACPI SRAT Table [Enabled]

Enables or disables the building of ACPI SRAT table.
Configuration options: [Disabled] [Enabled]

CPU Prefetching [Enabled]

Allows you to enable or disable CPU prefetching.
Configuration options: [Enabled] [Disabled]

AMD Live! [Disabled]

Enables or disables the AMD Live! technology support.
Configuration options: [Disabled] [Enabled]

C1E Support [Disabled]

Allows you to enable or disable the Enhanced Halt State support.
Configuration options: [Disabled] [Enable]

2.5.2 Chipset

The **Chipset** menu allows you to change the advanced chipset settings. Select an item then press **<Enter>** to display the submenu.

NorthBridge Configuration

ECC Configuration

ECC Mode [Disabled]

Disables or sets the DRAM ECC mode that allows the hardware to report and correct memory errors. Set this item to [Basic], [Good], or [Max] to allow ECC mode auto-adjustment. Set this item to [Super] to adjust the **DRAM BG Scrub** sub-item manually. You may also adjust all sub-items by setting this item to [User].
Configuration options: [Disabled] [Basic] [Good] [Super] [Max] [User]

DRAM ECC Enable [Enabled]

Set this item to [Enabled] to allow hardware to report and correct memory errors automatically, maintaining system integrity.
Configuration options: [Disabled] [Enabled]

DRAM SCRUB REDIRECT [Enabled]

Enables or disables the DRAM SCRUB REDIRECT feature that allows the system to correct the DRAM ECC errors immediately when they occur.
Configuration options: [Disabled] [Enabled]

4-Bit ECC Mode [Enabled]

Enables or disables the ECC chip kill feature.
Configuration options: [Disabled] [Enabled]

DRAM BG SCRUB [Disabled]

Disables or sets the DRAM BG Scrub.
Configuration options: [Disabled] [40ns] [80ns] [160ns] [320ns] [640ns] [1.28us] [2.56us] [5.12us] [10.2us] [20.5us] [41.0us] [81.9us] [163.8us] [327.7us] [655.4us] [1.31ms] [2.62ms] [5.24ms] [10.49ms] [20.97ms] [42.00ms] [84.00ms]

Data Cache BG Scrub [Disabled]

Disables or sets the Data Cache BG Scrub. This item allows the L1 Data Cache RAM to be corrected when idle.
Configuration options: [Disabled] [40ns] [80ns] [160ns] [320ns] [640ns] [1.28us] [2.56us] [5.12us] [10.2us] [20.5us] [41.0us] [81.9us] [163.8us] [327.7us] [655.4us] [1.31ms] [2.62ms] [5.24ms] [10.49ms] [20.97ms] [42.00ms] [84.00ms]

L2/L3 Cache BG Scrub [Disabled]

Disables or sets the L2/L3 Cache BG Scrub. This item allows the L2/L3 Data Cache RAM to be corrected when idle.
Configuration options: [Disabled] [40ns] [80ns] [160ns] [320ns] [640ns] [1.28us] [2.56us] [5.12us] [10.2us] [20.5us] [41.0us] [81.9us] [163.8us] [327.7us] [655.4us] [1.31ms] [2.62ms] [5.24ms] [10.49ms] [20.97ms] [42.00ms] [84.00ms]

RS780 Configuration

Internal Graphics Configuration

This menu allows you to change the onboard graphics configuration settings. Select an item then press <Enter> to display the sub-menu.

Internal Graphics Mode [UMA]

Allows you to set the frame buffer location for the onboard GPU.
Configuration options: [Disable] [UMA]

UMA Frame Buffer Size [Auto]

This item appears only when you set the **Internal Graphics Mode** item to [UMA].
Configuration options: [Auto] [32MB] [64MB] [128MB] [256MB] [512MB]

GFX Engine Clock Override [Disable]

Allows you to enable or disable the GFX Engine Clock Override support.
Configuration options: [Disable] [Enable]

GFX Engine Clock [650]

This item appears only when you set the **GFX Engine Clock Override** item to [Enable]. Use the <+> and <-> keys to change the value or type the desired value using the numeric keypad. The values range from 150 to 1000.

Surround View [Auto]

If you set the PCI Express device as the primary display and enable this item, you may use the internal graphics as the secondary display.
Configuration options: [Disabled] [Auto]

FB Location [Above 4G]

Configuration options: [Below 4G] [Above 4G]

AMD 780 HD Audio [Enable]

Enables or disables the Northbridge HD audio support.
Configuration options: [Disabled] [Enable]

PCI Express Configuration

This menu allows you to change the PCI Express Configuration settings. Select an item then press <Enter> to display the sub-menu.

GFX Dual Slot Configuration [Auto]

Configuration options: [Auto] [Enable] [Disabled]

GPP Slots Power Limit, W [25]

Use the <+> and <-> keys to change the value or type the desired value using the numeric keypad. The values range from 0 to 255.

Port #02 Features

Gen2 High Speed Mode [Auto]

Configuration options: [Auto] [Disabled] [Software Initiated] [Advertised RC]

Link ASPM [Disabled]

Configuration options: [Disabled] [L0s] [L1] [L0s & L1]

Link Width [Auto]

Configuration options: [Auto] [x1 Mode.] [x2] [x4] [x8 Mode.] [x16]

Slot Power Limit, W [75]

Use the <+> and <-> keys to change the value or type the desired value using the numeric keypad. The values range from 0 to 255.

Port #04/05/06/07/09/10 Features

Gen2 High Speed Mode [Disabled]

Configuration options: [Auto] [Disabled] [Software Initiated] [Advertised RC]

Link ASPM [Disabled]

Configuration options: [Disabled] [L0s] [L1] [L0s & L1]

NB-SB Port Features

NB-SB Link ASPM [Disabled]

Configuration options: [Disabled] [L1]

NP NB-SB VC1 Traffic Support [Disabled]

Configuration options: [Enabled] [Disabled]

Link Width [Auto]

Configuration options: [Auto] [x1 Mode.] [x2] [x4]

Primary Video Controller [GFX0-GPP-IGFX-PCI]

Allows you to select which graphics controller to use as the primary boot device.
Configuration options: [GFX0-GPP-IGFX-PCI] [GPP-GFX0-IGFX-PCI] [PCI-GFX0-GPP-IGFX] [IGFX-GFX0-GPP-PCI]

NB Power Management Features [Auto]

Allows you to enable or disable the NorthBridge power management features.
Configuration options: [Auto] [Disable]

2.5.3 Onboard Devices Configuration

HD Audio Device [Enabled]

Allows you to enable or disable the HD Audio controller.
Configuration options: [Disabled] [Enabled]

Front Panel Select [HD]

Allows you to set the front panel audio connector (AAFP) mode to legacy AC'97 or high-definition audio depending on the audio standard that the front panel audio module supports.
Configuration options: [AC97] [HD]

Onboard LAN [Enabled]

Allows you to enable or disable the onboard LAN.
Configuration options: [Enabled] [Disabled]

Onboard LAN Boot ROM [Disabled]

Allows you to enable or disable the onboard LAN Boot ROM.
Configuration options: [Disabled] [Enabled]

Serial Port1 Address [3F8/IRQ4]

Allows you to select the Serial Port1 base address.
Configuration options: [Disabled] [3F8/IRQ4][2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]

2.5.4 USB Configuration

The items in this menu allows you to change the USB-related features. Select an item then press **<Enter>** to display the configuration options.

The **Module Version** and **USB Devices Enabled** items show the auto-detected values. If no USB device is detected, the item shows **None**.

USB Support [Enable]

Allows you to enable or disable the USB Functions.
Configuration options: [Enabled] [Disabled]

Legacy USB Support [Enabled]

Allows you to enable or disable support for USB devices on legacy operating systems (OS). Setting to Auto allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.
Configuration options: [Disabled] [Enabled] [Auto]

USB 2.0 Controller Mode [HiSpeed]

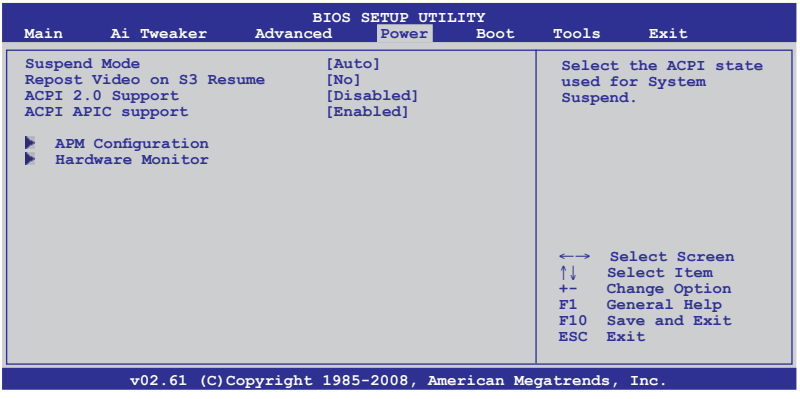
Allows you to configure the USB 2.0 controller in HiSpeed (480 Mbps) or Full Speed (12 Mbps).
Configuration options: [FullSpeed] [HiSpeed]

BIOS EHCI Hand-off [Enabled]

Allows you to enable the support for operating systems without an EHCI hand-off feature.
Configuration options: [Disabled] [Enabled]

2.6 Power menu

The **Power** menu items allow you to change the settings for the Advanced Configuration and Power Interface (ACPI) and the Advanced Power Management (APM). Select an item then press **<Enter>** to display the configuration options.



2.6.1 Suspend Mode [Auto]

Allows you to select the Advanced Configuration and Power Interface (ACPI) state to be used for system suspend.
Configuration options: [S1 (POS) Only] [S3 Only] [Auto]

[S1(POS) Only] - Enables the system to enter the ACPI S1 (Power on Suspend) sleep state. In S1 sleep state, the system appears suspended and stays in a low power mode. The system can be resumed at any time.

[S3 Only] - Enables the system to enter the ACPI S3 (Suspend to RAM) sleep state (default). In S3 sleep state, the system appears to be off and consumes less power than in the S1 state. When signaled by a wake-up device or event, the system resumes to its working state exactly where it was left off.

[Auto] - Detected by OS.

2.6.2 Repost Video on S3 Resume [No]

Determines whether to invoke VGA BIOS POST on S3/STR resume.
Configuration options: [No] [Yes]

2.6.3 ACPI 2.0 Support [Disabled]

Allows you to add more tables for Advanced Configuration and Power Interface (ACPI) 2.0 specifications.
Configuration options: [Disabled] [Enabled]

2.6.4 ACPI APIC Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) support in the Application-Specific Integrated Circuit (ASIC). When set to **Enabled**, the ACPI APIC table pointer is included in the RSDT pointer list.
Configuration options: [Disabled] [Enabled]

2.6.5 APM Configuration

Restore on AC Power Loss [Disabled]

When set to **Power Off**, the system goes into off state after an AC power loss. When set to **Power On**, the system goes on after an AC power loss.
Configuration options: [Disabled] [Power On] [Power Off] [Last State]

Power On From S5 By PME# [Disabled]

Allows you to enable or disable the PME to wake up from S5 by PCI devices.
Configuration options: [Disabled] [Enabled]

Power On By PS/2 Device [Disabled]

Enable or disable PS/2 Keyboard/Mouse to generate a wake event.
Configuration options: [Disabled] [Enabled]

Power On By Ring [Disabled]

Enable or disable RI to generate a wake event.
Configuration options: [Disabled] [Enabled]

Power On By RTC Alarm [Disabled]

Allows you to enable or disable RTC to generate a wake event. When this item is set to [Enabled**]**, the items **RTC Alarm Date** and **RTC Alarm Time** appear with set values.
Configuration options: [Disabled] [Enabled]

2.6.6 Hardware Monitor

CPU/MB Temperature [xxx°C/xxx°F]

The onboard hardware monitor automatically detects and displays the motherboard and CPU temperatures. Select [Ignored] if you do not wish to display the detected temperatures.

CPU Fan / Chassis Fan 1 / Power Fan Speed [xxxxRPM] or [Ignored]

The onboard hardware monitor automatically detects and displays the CPU, chassis, and power fan speed in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows **N/A**. Select [Ignored] if you do not wish to display the detected speed.

VCORE / 3.3V / 5V / 12V Voltage

The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators. Select **Ignored** if you do not wish to display the detected voltage output.

CPU Q-Fan Function [Disabled]

Allows you to enable or disable the CPU Q-Fan feature that smartly adjusts the fan speeds for more efficient system operation.
Configuration options: [Disabled] [Enabled]

Select Fan Type: [PWM Fan]

This item appears only when you set the **CPU Q-Fan Function** item to [Enabled] and allows you to select the CPU fan type you installed on the motherboard.
Configuration options: [PWM Fan] [DC Fan]

- If you install a PWM (4-pin) fan but set this item to [DC Fan], the fan you installed may not work.
- If you install a DC (3-pin) fan but set this item to [PWM Fan], the CPU Q-Fan function will not work, and the fan you install will always run at full speed.

Quiet CPU Fan Mode [Silent]

Allows you to set the appropriate performance level of the CPU Q-Fan. When set to [Optimal], the CPU fan automatically adjusts depending on the CPU temperature. Set this item to [Silent] to minimize fan speed for quiet CPU fan operation, or [Performance] to achieve the maximum CPU fan speed.
Configuration options: [Performance] [Optimal] [Silent]

Chassis Q-Fan Function [Disabled]

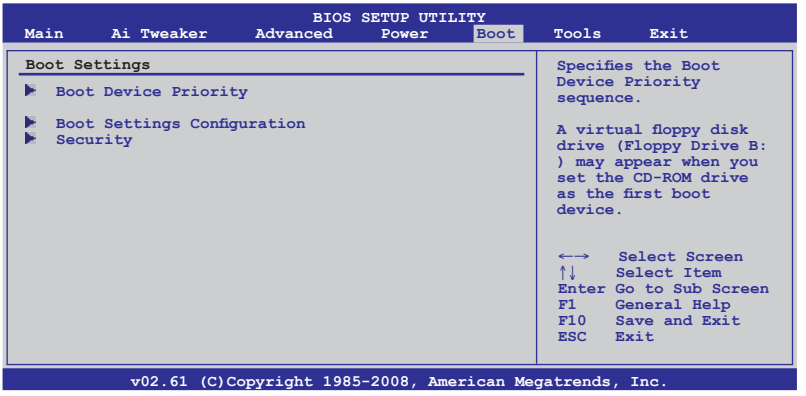
Allows you to enable or disable the chassis Q-Fan feature that smartly adjusts the fan speeds for more efficient system operation.
Configuration options: [Disabled] [Enabled]

Quiet CHASSIS Fan Mode [Silent]

Allows you to set the appropriate performance level of the Chassis Q-Fan. When set to [Optimal], the Chassis fan automatically adjusts depending on the Chassis temperature. Set this item to [Silent] to minimize fan speed for quiet Chassis fan operation, or [Performance] to achieve the maximum Chassis fan speed.
Configuration options: [Performance] [Optimal] [Silent]

2.7 Boot menu

The **Boot** menu items allow you to change the system boot options. Select an item then press **<Enter>** to display the submenu.



2.7.1 Boot Device Priority

1st ~ xxth Boot Device

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.
Configuration options: [1st FLOPPY DRIVE] [Hard Drive] [ATAPI CD-ROM] [Disabled]

2.7.2 Boot Settings Configuration

Quick Boot [Enabled]

Enabling this item allows the BIOS to skip some power on self tests (POST) while booting to decrease the time needed to boot the system. When set to **[Disabled]**, BIOS performs all the POST items.
Configuration options: [Disabled] [Enabled]

Full Screen Logo [Enabled]

This allows you to enable or disable the full screen logo display feature.
Configuration options: [Disabled] [Enabled]

Set this item to **[Enabled]** to use the ASUS MyLogo 2™ feature.

AddOn ROM Display Mode [Force BIOS]

Sets the display mode for option ROM.
Configuration options: [Force BIOS] [Keep Current]

Bootup Num-Lock [On]

Allows you to select the power-on state for the NumLock.
Configuration options: [Off] [On]

Wait for 'F1' If Error [Enabled]

When set to [Enabled], the system waits for the F1 key to be pressed when error occurs.
Configuration options: [Disabled] [Enabled]

Hit 'DEL' Message Display [Enabled]

When set to [Enabled], the system displays the message **Press DEL to run Setup** during POST.
Configuration options: [Disabled] [Enabled]

2.7.3 Security

The Security menu items allow you to change the system security settings. Select an item then press **<Enter>** to display the configuration options.

Change Supervisor Password

Select this item to set or change the supervisor password. The Supervisor Password item on top of the screen shows the default Not Installed. After you set a password, this item shows Installed.

To set a Supervisor Password

1. Select the Change Supervisor Password item and press <Enter>.
2. From the password box, type a password composed of at least six letters and/or numbers, then press <Enter>.
3. Confirm the password when prompted.

The message "Password Installed" appears after you successfully set your password.

To change the supervisor password, follow the same steps as in setting a supervisor password.

To clear the supervisor password, select the Change Supervisor Password then press <Enter>. The message "Password Uninstalled" appears.

If you forget your BIOS password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. See section **1.9 Jumper**s for information on how to erase the RTC RAM.

After you have set a supervisor password, the other items appear to allow you to change other security settings.

User Access Level [Full Access]

This item allows you to select the access restriction to the Setup items.
Configuration options: [No Access] [View Only] [Limited] [Full Access]

No Access prevents user access to the Setup utility.

View Only allows access but does not allow change to any field.

Limited allows changes only to selected fields, such as Date and Time.

Full Access allows viewing and changing all the fields in the Setup utility.

Change User Password

Select this item to set or change the user password. The User Password item on top of the screen shows the default Not Installed. After you set a password, this item shows Installed.

To set a User Password:

1. Select the Change User Password item and press <Enter>.
2. On the password box that appears, type a password composed of at least six letters and/or numbers, then press **<Enter>**.

3. Confirm the password when prompted.

The message “Password Installed” appears after you set your password successfully.
To change the user password, follow the same steps as in setting a user password.

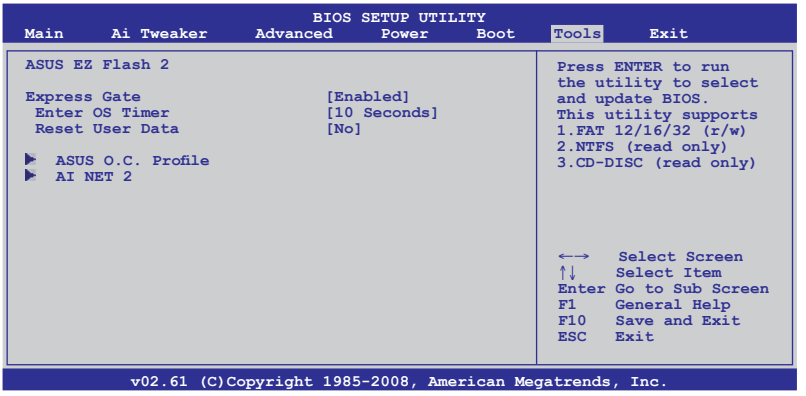
Clear User Password

Select this item to clear the user password.

Password Check [Setup]

When set to **[Setup]**, BIOS checks for user password when accessing the Setup utility. When set to **[Always]**, BIOS checks for user password both when accessing Setup and booting the system.
Configuration options: [Setup] [Always]

2.8 Tools menu



2.8.1 ASUS EZ Flash 2

Allows you to run ASUS EZ Flash 2. When you press **<OK>**, a confirmation message appears. Use the left/right arrow key to select between **[Yes]** or **[No]**, then press **<OK>** to confirm your choice.

2.8.2 Express Gate [Enabled]

Allows you to enable or disable the ASUS Express Gate feature. The ASUS Express Gate feature is a unique instant-on environment that provides quick access to the Internet browser and Skype.
Configuration options: [Enabled] [Disabled]

Enter OS Timer [10 Seconds]

Sets countdown duration that the system waits at the Express Gate’s first screen before starting Windows or other installed OS. Choose [Prompt User] to stay at the first screen of Express Gate for user action.
Configuration options: [Prompt User] [1 second] [3 seconds] [5 seconds] [10 seconds] [15 seconds] [20 seconds] [30 seconds]

Reset User Data [No]

Allows you to clear Express Gate's user data.
Configuration options: [No] [Reset]
When setting this item to [Reset], make sure to save the setting to the BIOS so that the user data will be cleared the next time you enter the Express Gate. User data includes the Express Gate's settings as well as any personal information stored by the web browser (bookmarks, cookies, browsing history, etc.). This is useful in the rare case where corrupt settings prevent the Express Gate environment from launching properly.

The first time wizard will run again when you enter the Express Gate environment after clearing its settings.

2.8.3 ASUS O.C. Profile

This item allows you to store or load multiple BIOS settings.

Add Your CMOS Profile.

Allows you to save the current BIOS file to the BIOS Flash. In the **Name** sub-item, type your profile name and press <Enter>, and then choose a profile number to save your CMOS settings in the **Save To** sub-item. You can save eight (8) CMOS profiles.

Load CMOS Profile.

Allows you to load the previous BIOS settings saved in the BIOS Flash. Press <Enter>, and choose a profile to load.

Start O.C. Profile

Allows you to run the utility to save and load CMOS. Press <Enter> to run the utility.

- This function can support devices such as a USB flash disk or a floppy disk with FAT 32/16 format and single partition only.
- DO NOT shut down or reset the system while updating the BIOS to prevent the system boot failure!
- Suggest only to update the BIOS file coming from the same memory/CPU configuration and BIOS version.
- Only the "xxx.CMO" file can be loaded.

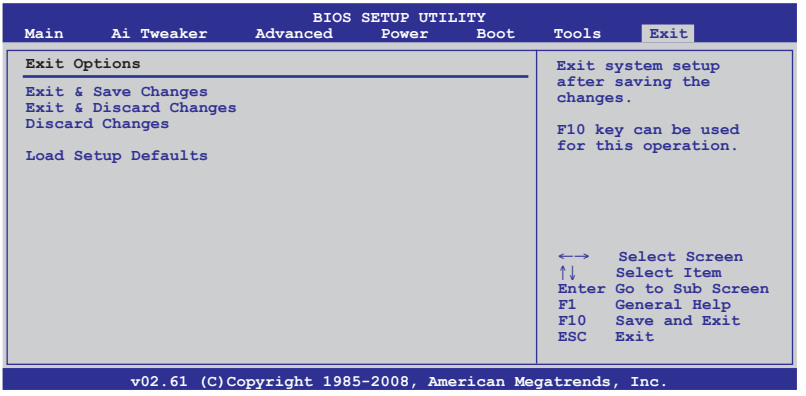
2.8.4 AI NET 2

Check Atheros LAN cable [Disabled]

Enables or disables checking of the Atheros LAN cable during the Power-On Self-Test (POST).
Configuration options: [Disabled] [Enabled]

2.9 Exit menu

The Exit menu items allow you to load the optimal or failsafe default values for the BIOS items, and save or discard your changes to the BIOS items.



Pressing <Esc> does not immediately exit this menu. Select one of the options from this menu or <F10> from the legend bar to exit.

Exit & Save Changes

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. An onboard backup battery sustains the CMOS RAM so it stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select **OK** to save changes and exit.

If you attempt to exit the Setup program without saving your changes, the program prompts you with a message asking if you want to save your changes before exiting. Press <Enter> to save the changes while exiting.

Exit & Discard Changes

Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than System Date, System Time, and Password, the BIOS asks for a confirmation before exiting.

Discard Changes

This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select OK to discard any changes and load the previously saved values.

Load Setup Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press <F5>, a confirmation window appears. Select OK to load default values. Select **Exit & Save Changes** or make other changes before saving the values to the non-volatile RAM.